

Task 2.2

Task Title

Socio-economic drivers of future hydropower production

Research Partners

Swiss National Institute of Forest, Snow and Landscape Research (WSL), Research Center for Sustainable Energy and Water Supply (FoNEW) at the University of Basel, Institute for Environmental Sciences (ISE) at the University of Geneva, University of Applied Sciences (HTW Chur), University of Applied Sciences and Arts Western Switzerland (HES-SO)

Task Objectives

Within the Energy Strategy 2050 hydropower is envisioned to increase production (which includes the need for retrofitting older hydropower plants), is supposed to provide the needed flexibility to accommodate large shares of renewable energy generation, and plays an important role in regional economies and developments (especially in mountain cantons). Understanding the impact of current and future market and policy conditions will be crucial for the development of the Swiss hydro system.

The socio-economic boundary conditions and their impact on the Swiss hydro system will be analyzed in cooperation with associated research partners from the SCCER CREST and the SCCER-FURIES developing evaluations of the Swiss transmission system. They will provide assessments of the future development of liberalized electricity markets with a high share of intermittent generation based on bottom-up market models.

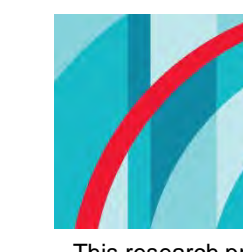
Current Project Report (presented on the following page)

The Future of Swiss Hydropower – A Review on Drivers and Uncertainties

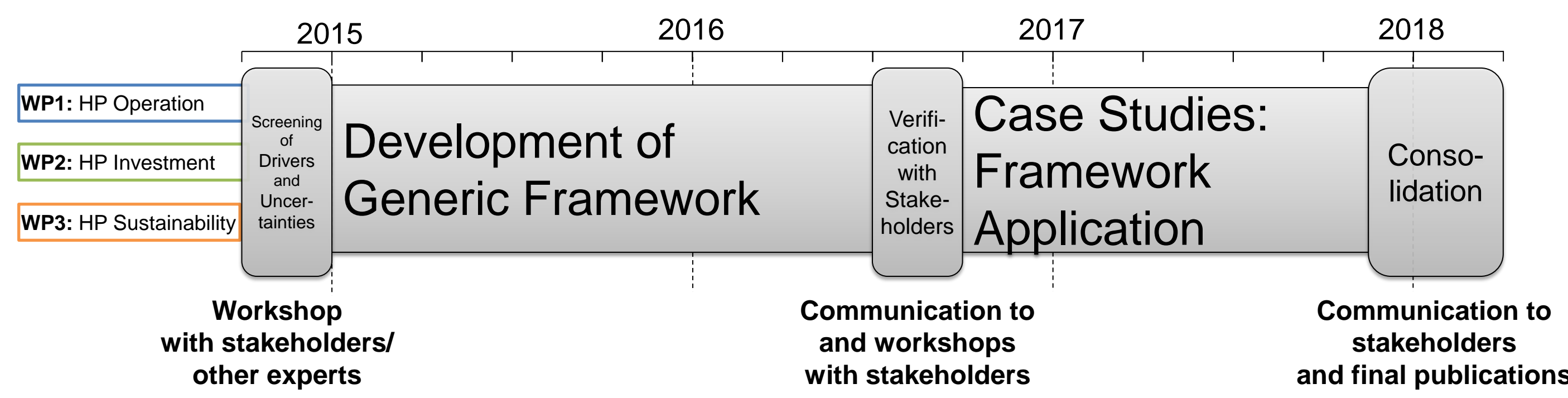
M. Barry, P. Baur, L. Gaudard, G. Giuliani, W. Hediger, F. Romero, M. Schillinger, R. Schumann, G. Voegeli, H. Weigt

The Future of Swiss Hydropower A Review on Drivers and Uncertainties

Michael Barry, Patrick Baur, Ludovic Gaudard, Gianluca Giuliani, Werner Hediger, Franco Romero, Moritz Schillinger, René Schumann, Guillaume Voegeli, Hannes Weigt



Project:



Project Team:

Weigt, UniBas: Lead, WP1
Schumann, HES-SO: WP1
Romero, UniGe: WP2, WP3
Hediger, HTW Chur: WP3, WP2

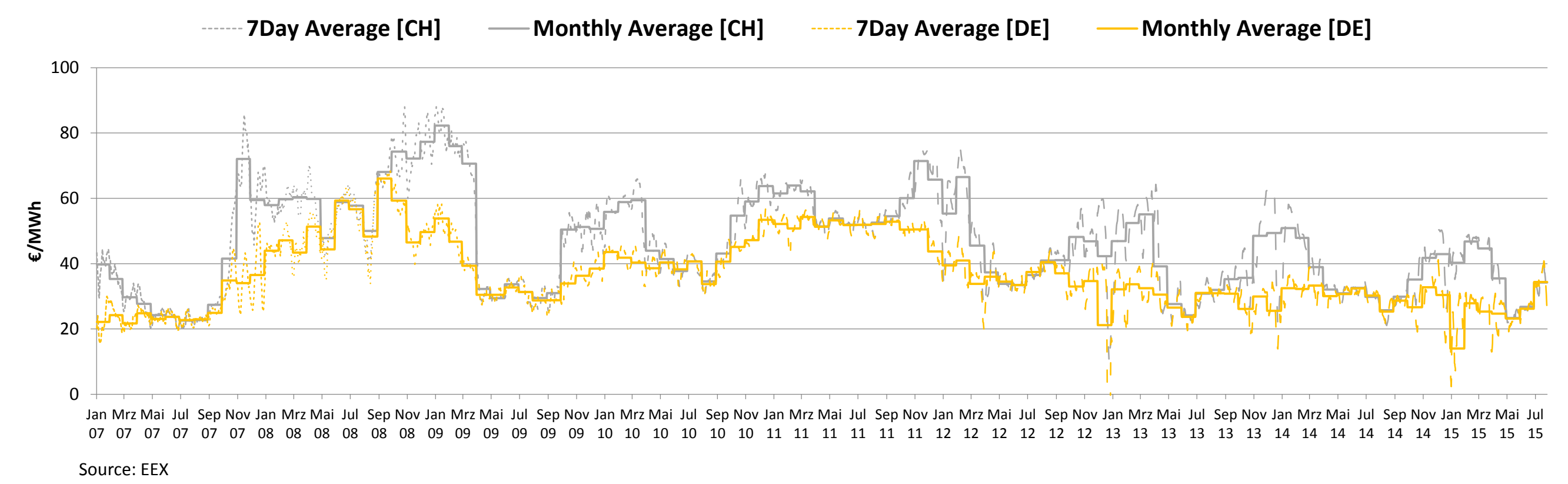
Project Partners:

Alpiq, Repower, Azienda Elettrica Ticinese (AET), Forces Motrices Valaisannes (FMV), and Misurio

Case Studies:

1. Pilot SA in Valposchiavo, Grisons (Repower)
2. Single-site in Valais (Alpiq)
3. Multi-site in Leventina, Ticino (AET, Alpiq)

Market Aspects:



Market prices are on a low level, due to:

- Low emission permit prices
- Low global coal price level
- Increase of renewable generation

→ Trends are likely to remain stable in coming years

→ Little influence possibilities

→ Swiss HP needs to adjust to market environment

Workshop and Questionnaire March 12, Berne:

45 participants from

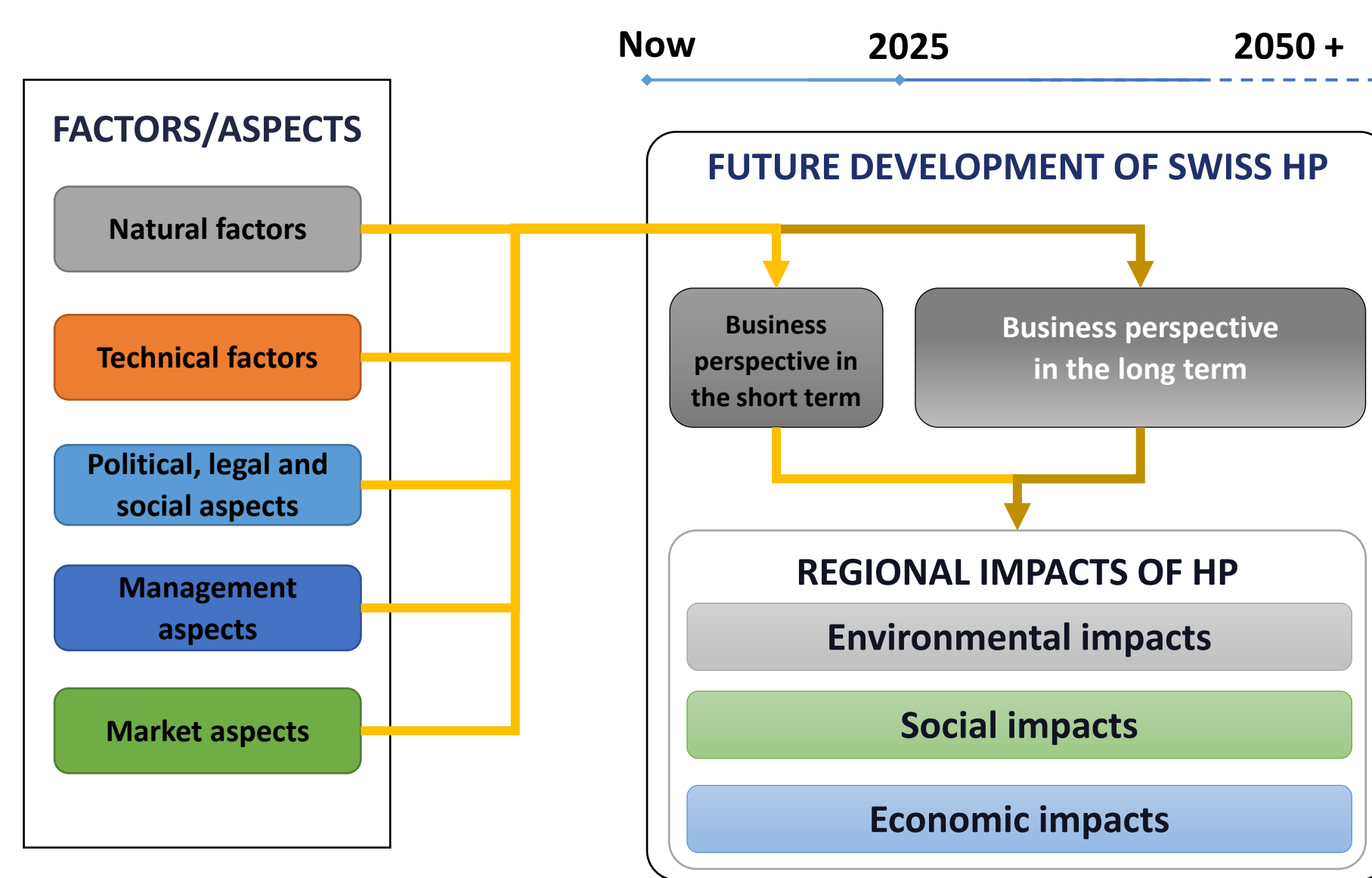
- Business/Industry
- University/Research
- Administration
- NGO

External input from:

- Norway (A. Midttun)
- Germany (C.v. Hirschhausen)

Discussion on:

- Short-Term Challenges
- Long-Term Aspects



Main Drivers and Impacts in the HP System

Policy Aspects:

Investment/Financing:

- High initial investment costs
- Debt financing
- Long Lifetimes
- Linear depreciation

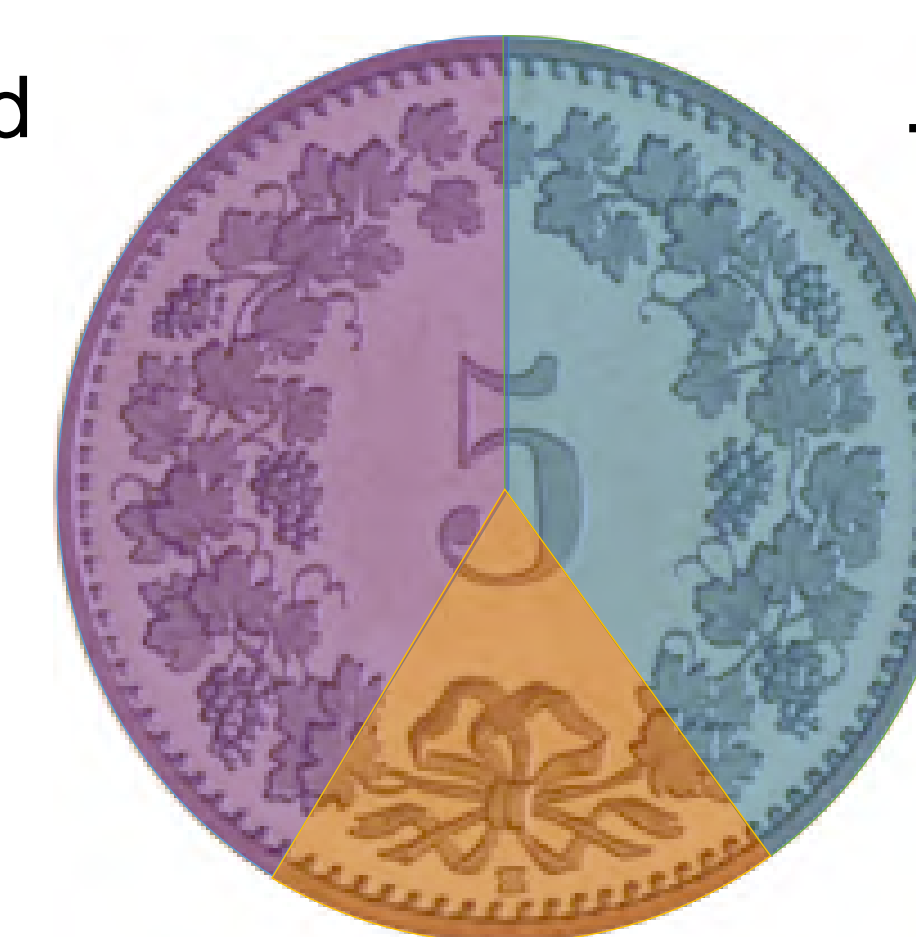
Governance:

- Concessions
- Water fees
- Network fees
- Partnerwerke

→ Designed for non-market environment

→ Need to be adjusted for risky, cyclical dynamics of liberalized markets

→ Structure based on regulated environment
→ Adjustment process will require agreements at federal, cantonal and local level

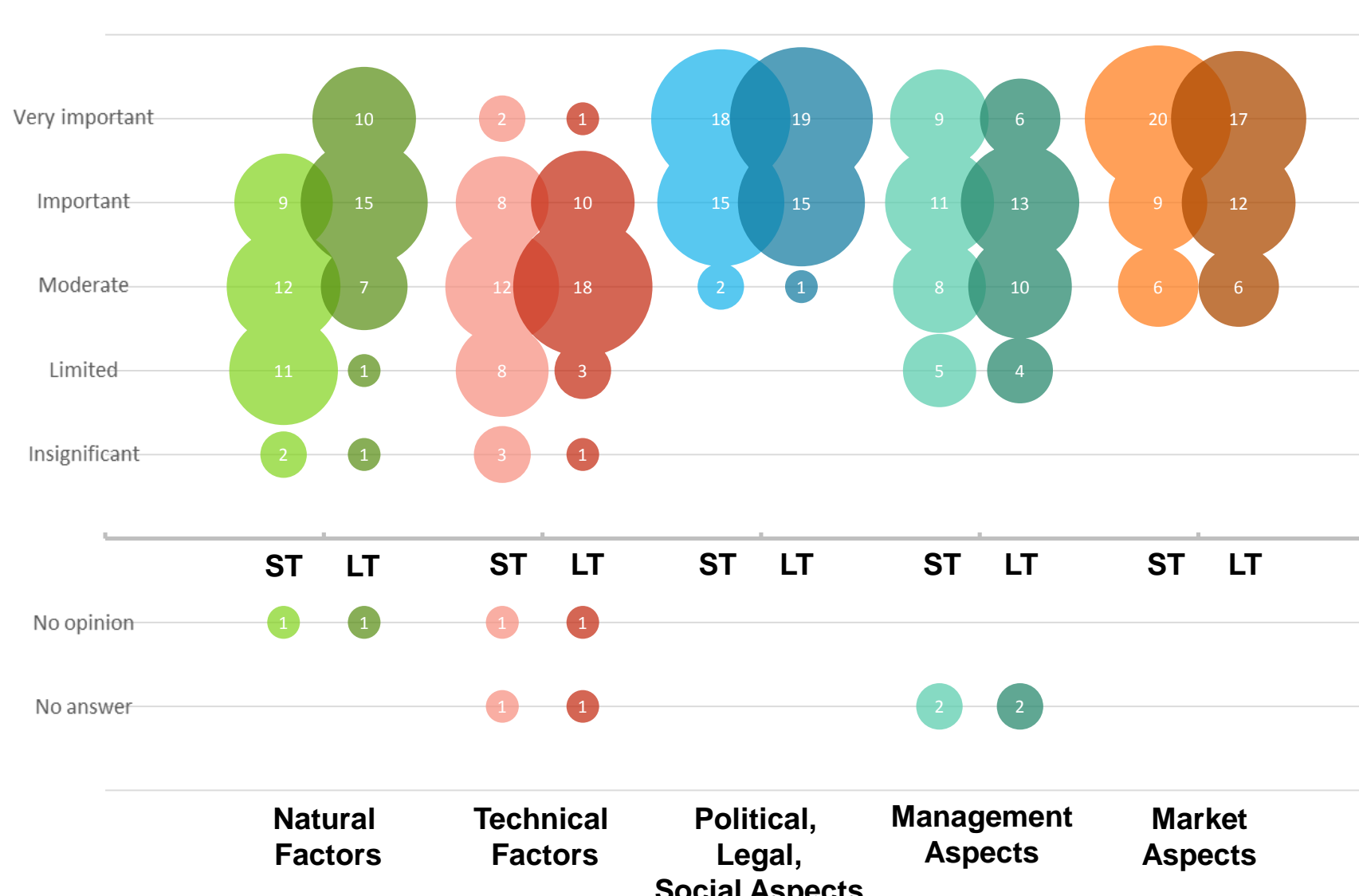


Operation:

High labour costs in comparison to EU competitors

→ Further efficiency gains possible?

Findings:

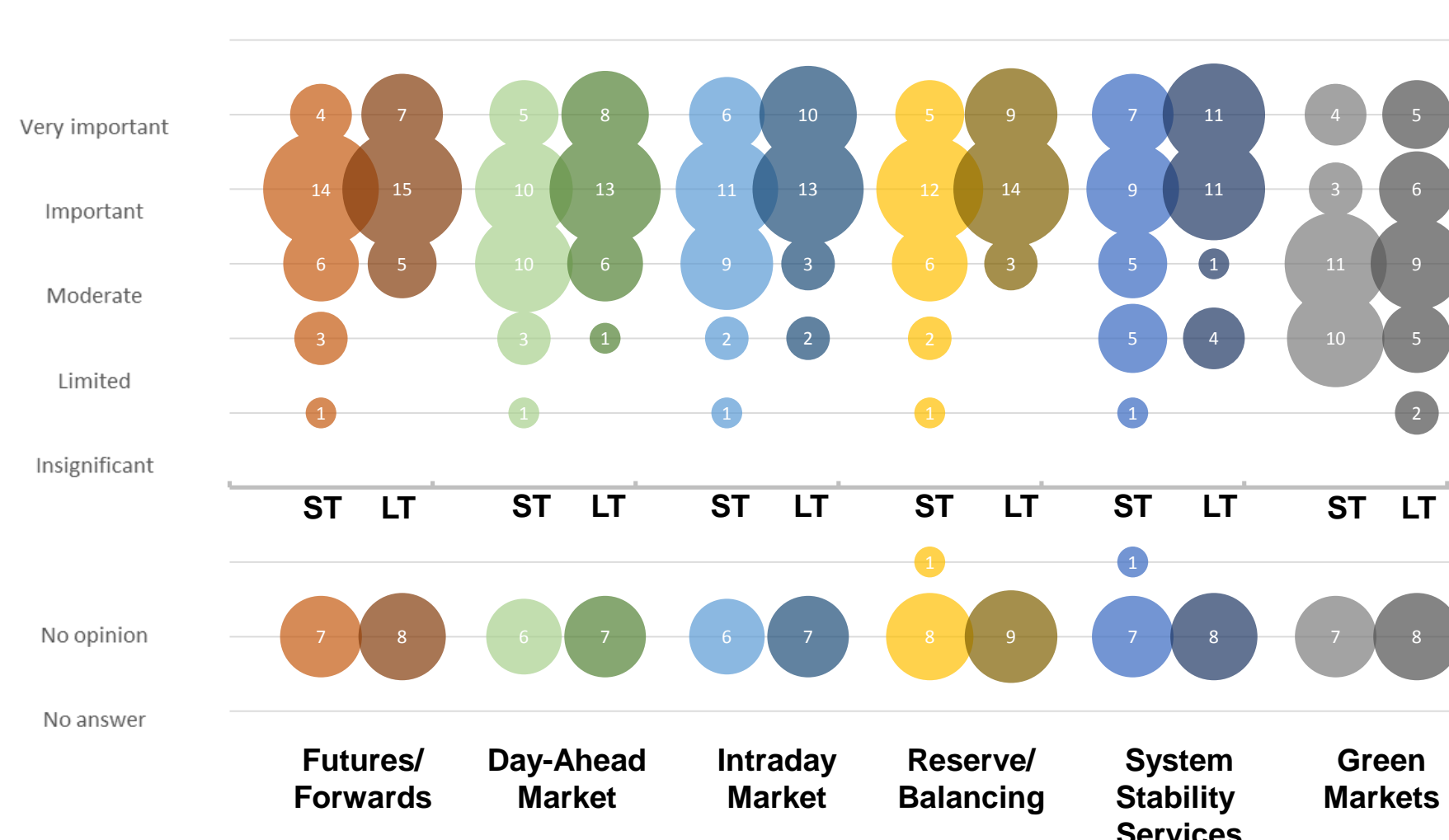


All aspects perceived as important

Market and Legal/Policy aspects most important

Natural and Technical factors less urgent

Relative Influence of Factors on the Future of Swiss HP in the Short (ST) and Long Term (LT)



Swiss HP must take all markets opportunities into account
Only Green Markets are seen not as important as the other

Influence of Markets on the Future of Swiss HP in the Short (ST) and Long Term (LT)

Next Steps

- **Evaluation of HP Operation:** Which markets are important? How can the performance be improved?
- **Development of Long Term Evaluation Approach:** How to deal with high uncertainty in the long run (investment decision)?
- **Initiate a comprehensive stakeholder process:** to analyse the companies' internal and external regulatory framework and design new approaches, to perform an regional impact analysis, and to investigate the interplay between Switzerland and Europe

For more information visit our project homepage:

<https://fonew.unibas.ch/forschungsprojekte/projekte/hp-future/>