

# Solar energy with TES

Vispertsolar

Soltermann Martin | © Lonza | 9. Januar 2026

Public





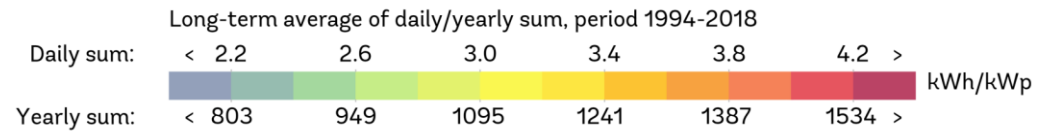
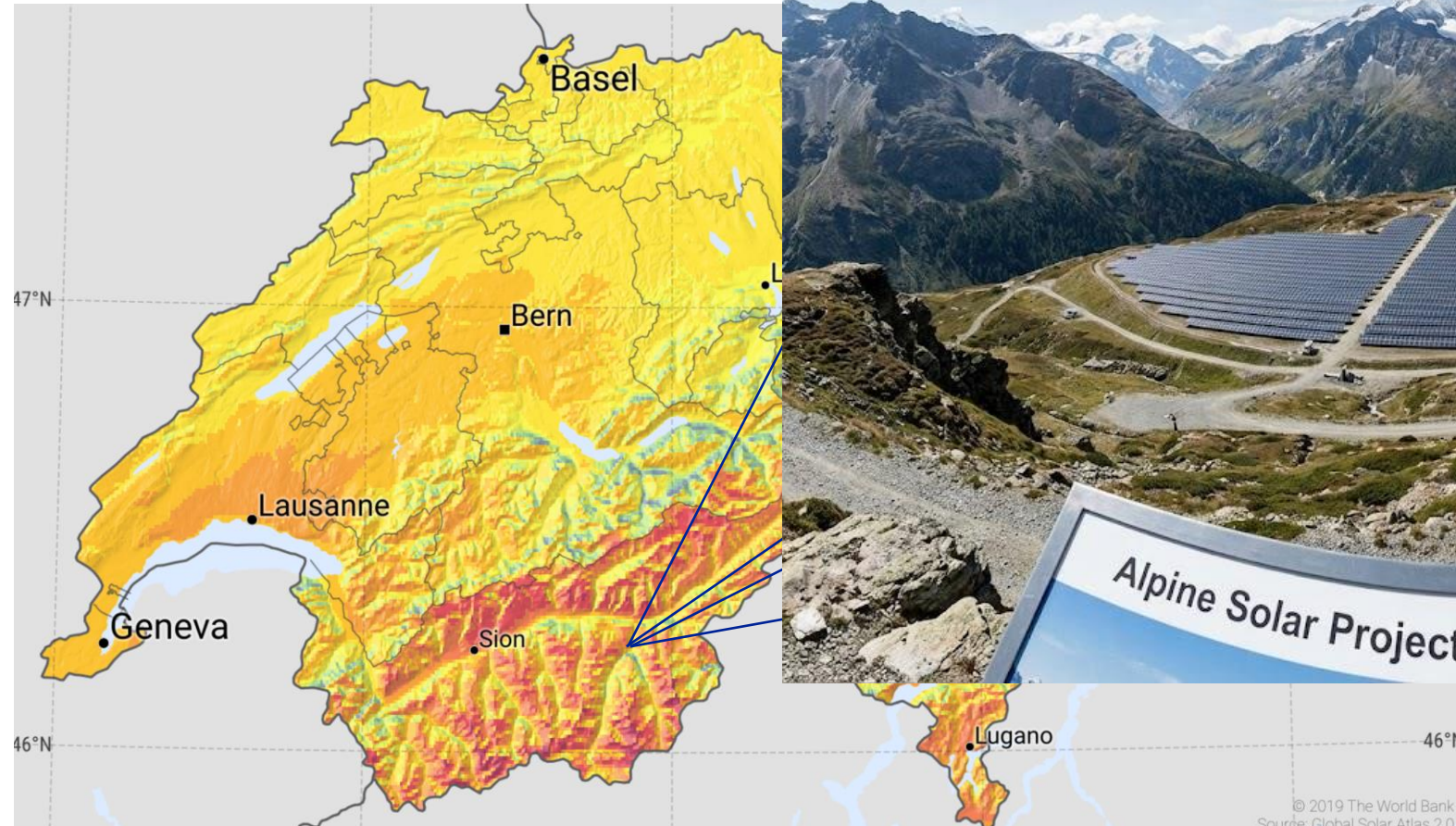
**1 % Electricity  
consumption of Switzerland  
(510 GWh)**

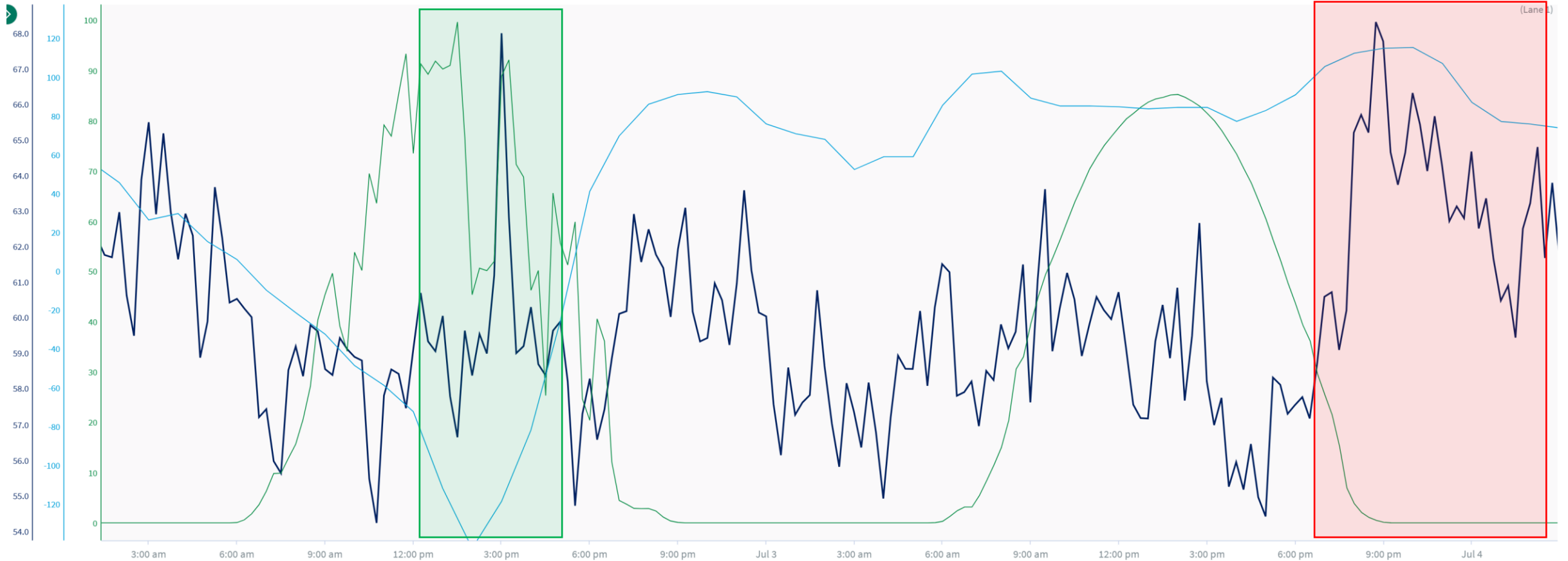
**1.5 % Natural Gas consumption  
of Switzerland  
(420 GWh)**

**Energy 940 GWh  
2.54 GWh per day  
~106 MW**

# Solar Power from the mountains

## Vispertsolar



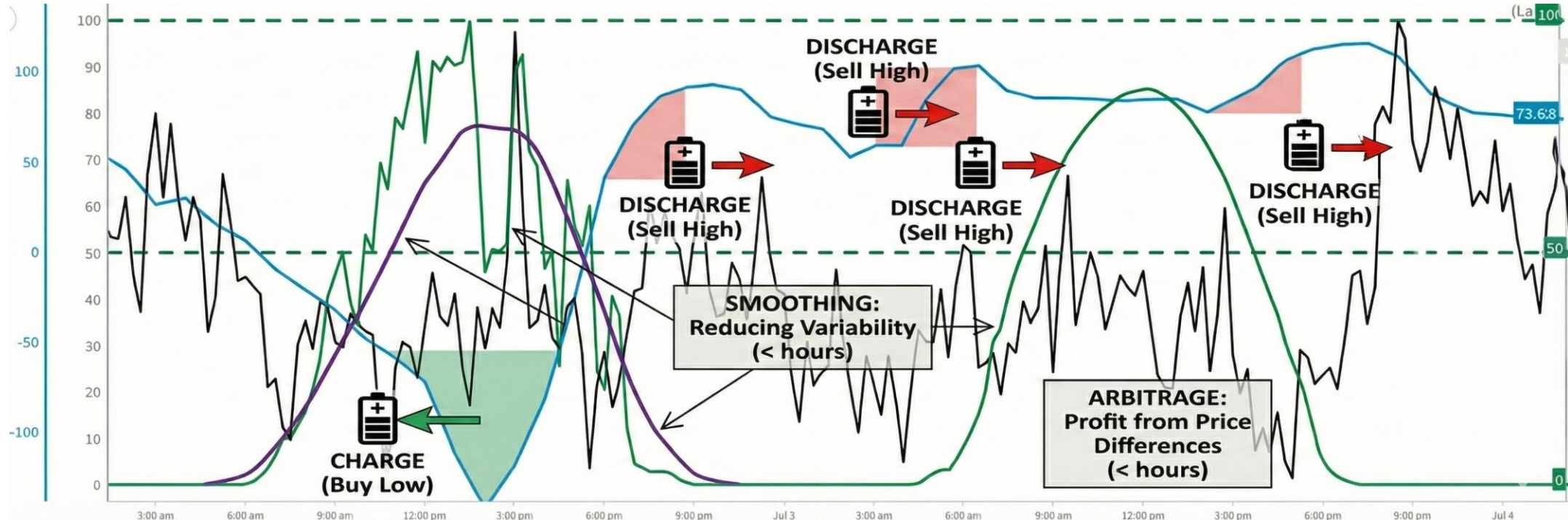


**Blue curve:** spot price 1 MWh electricity (Electricity working price in CHF/MWh)

**Green curve:** djournal pv production (max. 100%)

**Black curve: Steam Demand (to/h)**

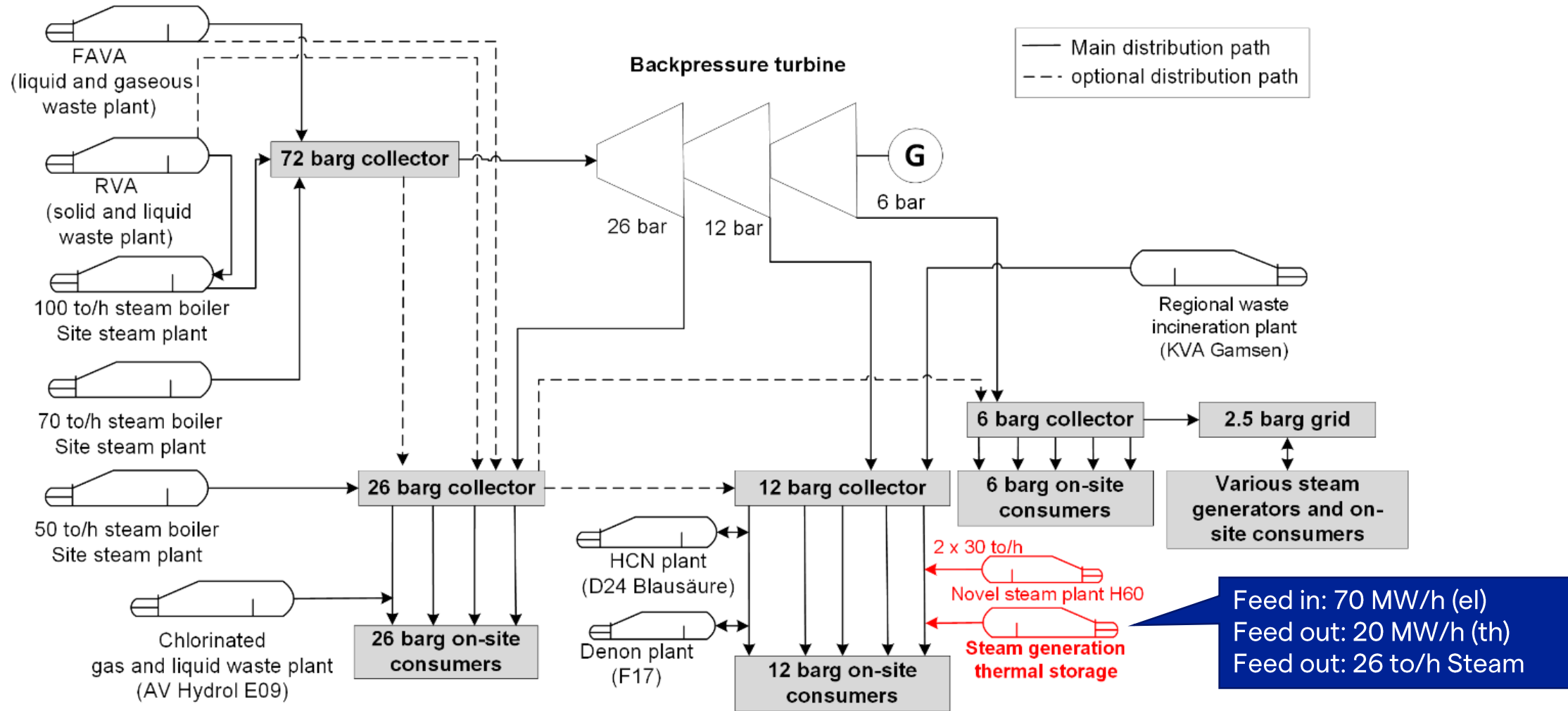
- Demand mismatch
- Capacity mismatch
- Time mismatch
- Dynamic mismatch
- Economic mismatch



- Arbitrage: Spot Day-Ahead, Intraday (Time frame: < hours)
- Smoothing: Djurnal, Seasonal (Time frame: < hours, < seasons)
- Grid Stabilization: Electricity driven (time frame: ms to min)



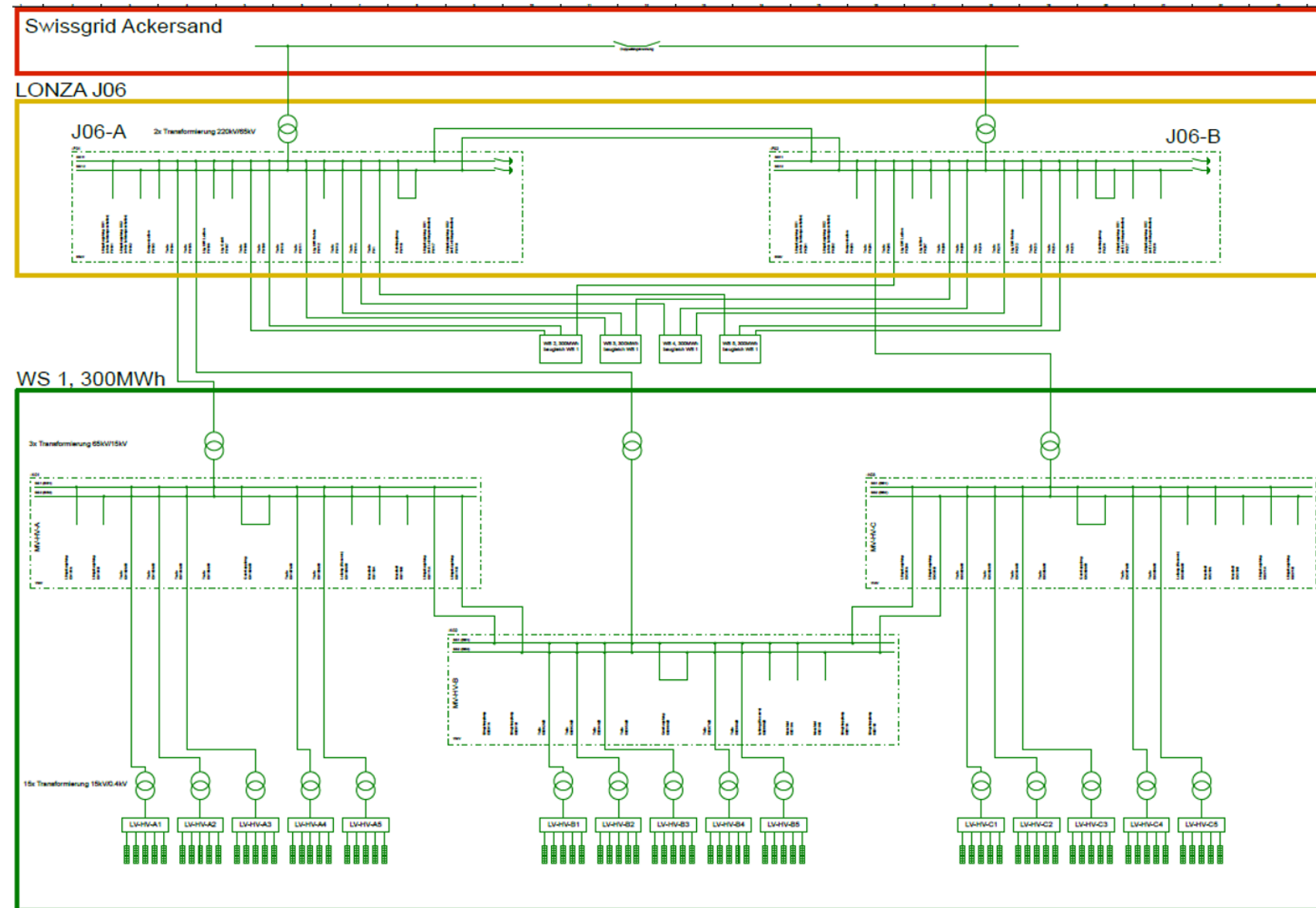
# Steam distribution scheme



## Network level 2 (Swissgrid)

Tax, Levis, VAT (2023)		
<b>Grid level 2</b>	Rp/kWh	Netzwerkebene 2
<b>Rate of grid</b>	0.26	Netznutzungstarif
<b>SDL (System services)</b>	0.75	Allgemeine Systemdienstleistungen
<b>KEV (Feed-in remuneration at cost)</b>	2.30	Netzzuschlag
<b>Current reserve</b>	1.20	Stromreserve
<b>Total (Tax, Levis, Grid)</b>	4.51	
<b>Rate per kWh (Energy)</b>	7.363	Energiepreis (Arbeit)
<b>Total (with Energy)</b>	11.873	Summe

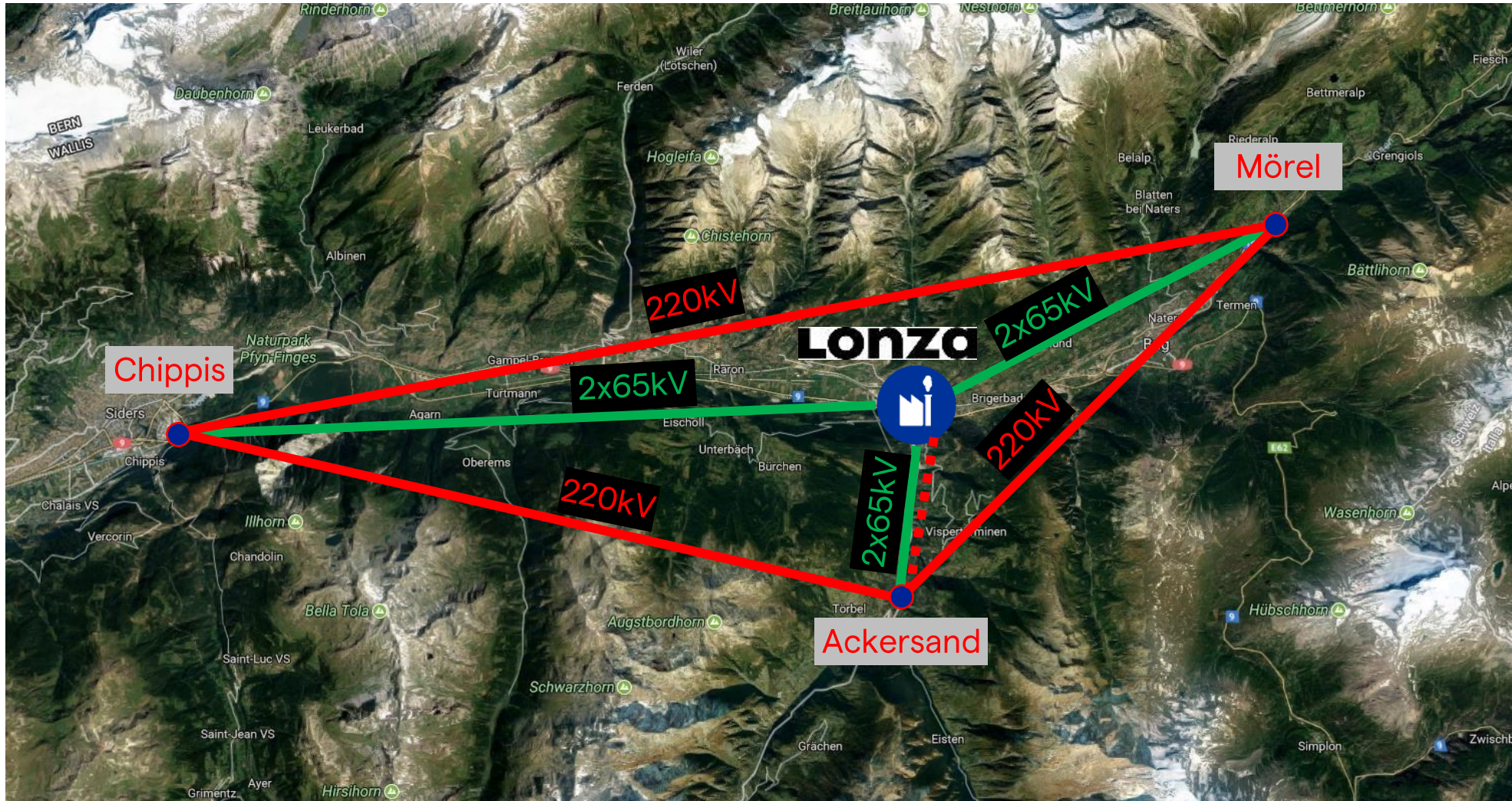
- TES for 300 MWh storage capacity and power line requirement of 70 MW, this results in the picture.



# Electrical supply Infrastructure

12 years for 6.5 km

# Lonza



 **swissgrid**

 **VALGRID AG**

 **Lonza**

# Cost situation

Capex (Capital Expenditure) / Opex (Operational Expenditure)

Description	Cost Estimate [%]	Cost Estimate [%]	Comments
Enabling works	0.25	2	
Civil/Building	3	22	Only Civil works
TES Process Equipment	15	<b>100</b>	
Utilities Equipment	1	8	
EI&C	7	46	Electrical and Instrumentation Package
Electrical supply Infrastructure	40	271	Dedicated building for TES
Mechanical and Piping works	8	53	
Start-Up	2	16	
Engineering	10	70	External and Lonza Engineering
Contingency	13	88	15 % from Base Cost
<b>Total CAPEX</b>	<b>100</b>	<b>675</b>	

*Ratio*  
 ~ 1 Steam Cost (OPEX)  
 ~ 5 Energy Source  
 ~ 6 Natural Gas  
 Only electricity (E-Steamer)  
 Electricity with TES (with subsidies)

Soil Contamination - Opex	2	11.6	Benchmark last Steam Project
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# Merci

- Slide 2: Picture from Google Banana Gemini, generation of Alpine PV with mountains.
- Slide 3: <https://globalsolaratlas.info/download/switzerland>
- Slide 4: Data from Lonza and EPEXspot
- Slide 5: Picture from Google Banana Gemini and Lonza
- Slide 6, 7, 9: Feasibility Study (not public) with Contributors: HSLU, DSM-Firmenich, Arxada AG, Lonza AG
- Slide 8: Swisstopo and Lonza