

WP5 Geothermal Production Data - Update

30-09-2025

WP5 – Geothermal Production Data

Motivation

- Geothermal plants have annual O&M costs ranging from 3% to 8% of CAPEX.
- Improved monitoring can provide timely information, making operators more proactive in O&M decisions.

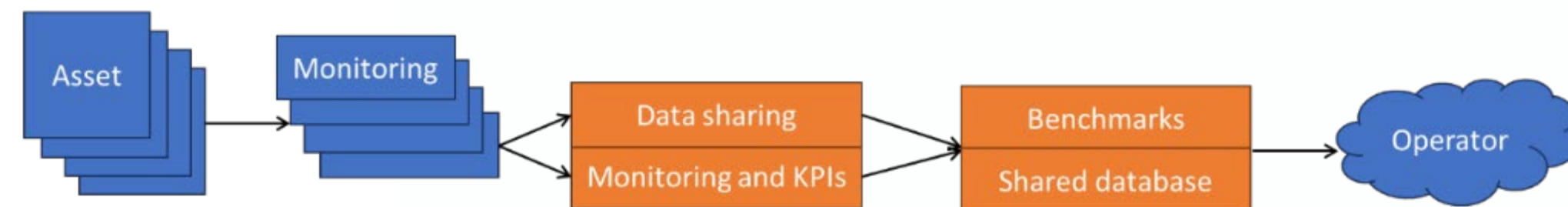
Current Challenges

- **Underutilized Data:** Production data is not fully leveraged for optimization.
- **Effort Required:** Creating valuable information from raw data is challenging.
- **Standardization Needed:** Generic workflows reduce costs and facilitate data sharing.

Activities

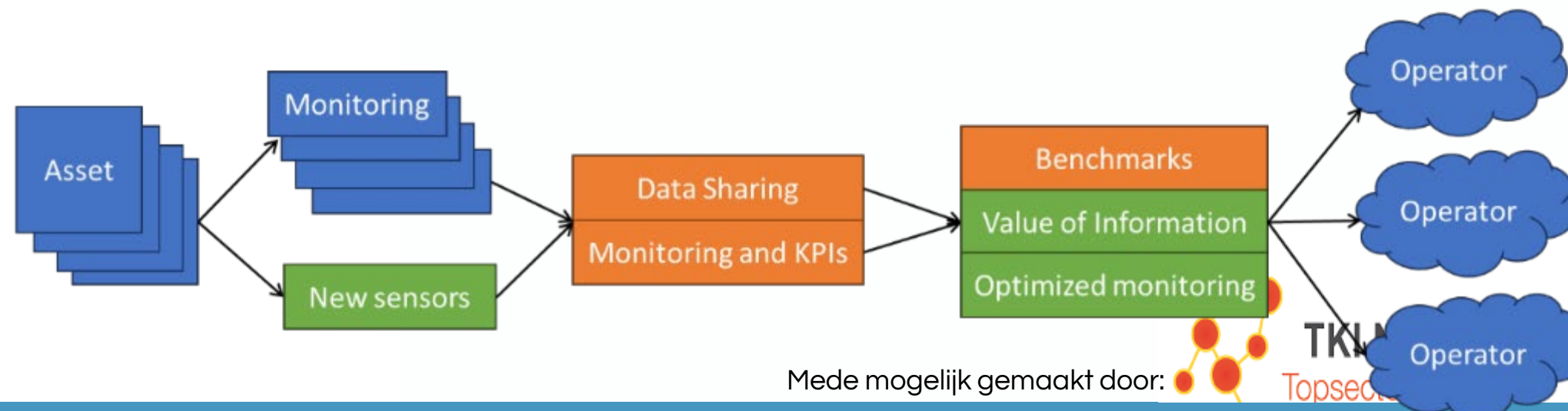
5.1 Existing Data

- Define KPIs for geothermal plants (available data).
- Standardized template for data collection
- A shared database on performance/ failure of equipment and components and NORM.



5.2 New Data

- Overview of monitoring options
- Improve the monitoring by installing new sensors
- Value of Information study



Mede mogelijk gemaakt door: 

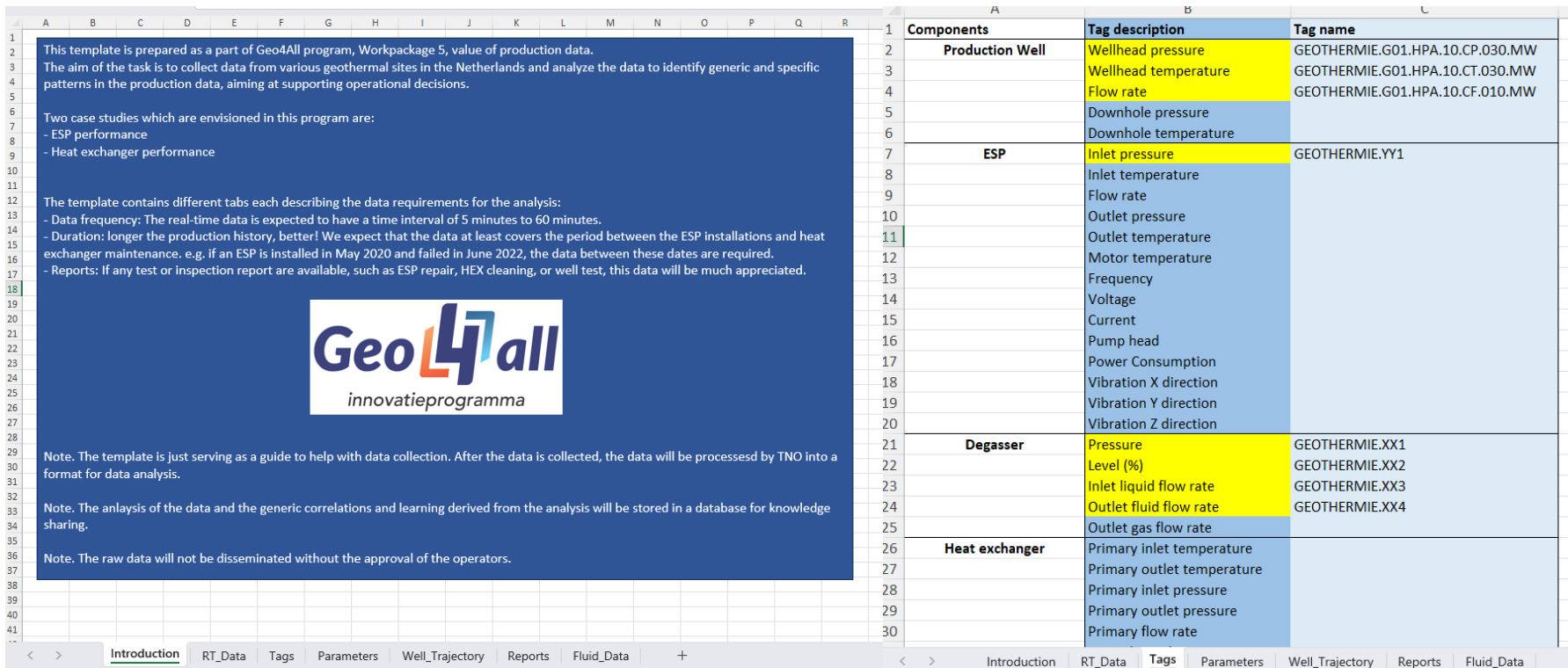
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5.1 Existing Data

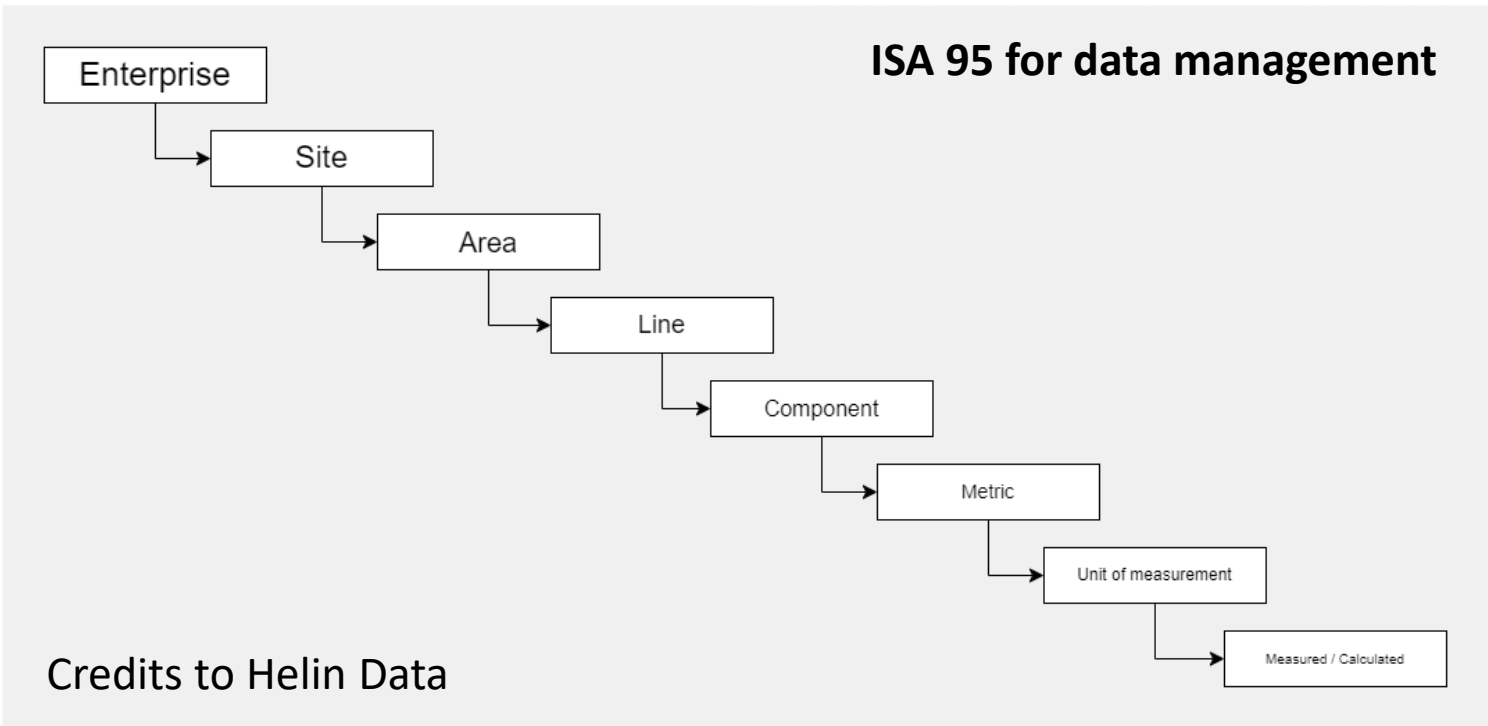
- KPIs have been defined for geothermal assets & equipment: the focus is on **performance** and **reliability indicators**
- Standardized template** to define critical components and their key characteristics has been **finalized**
- Data gathered from 11 sites** (more in progress)
- NORM study tasks defined** and shared between Geothermie NL and TNO. The results to be incorporated in the database
- Scripts are made to automatically extract features from database.
- A shared database on performance/ failure of equipment will be made available.
- Task expected to be completed by Q3, 2026

5.2 New Data

- Power quality measurements in Koekoekspolder is in progress.
- Task to start in Q4, 2025



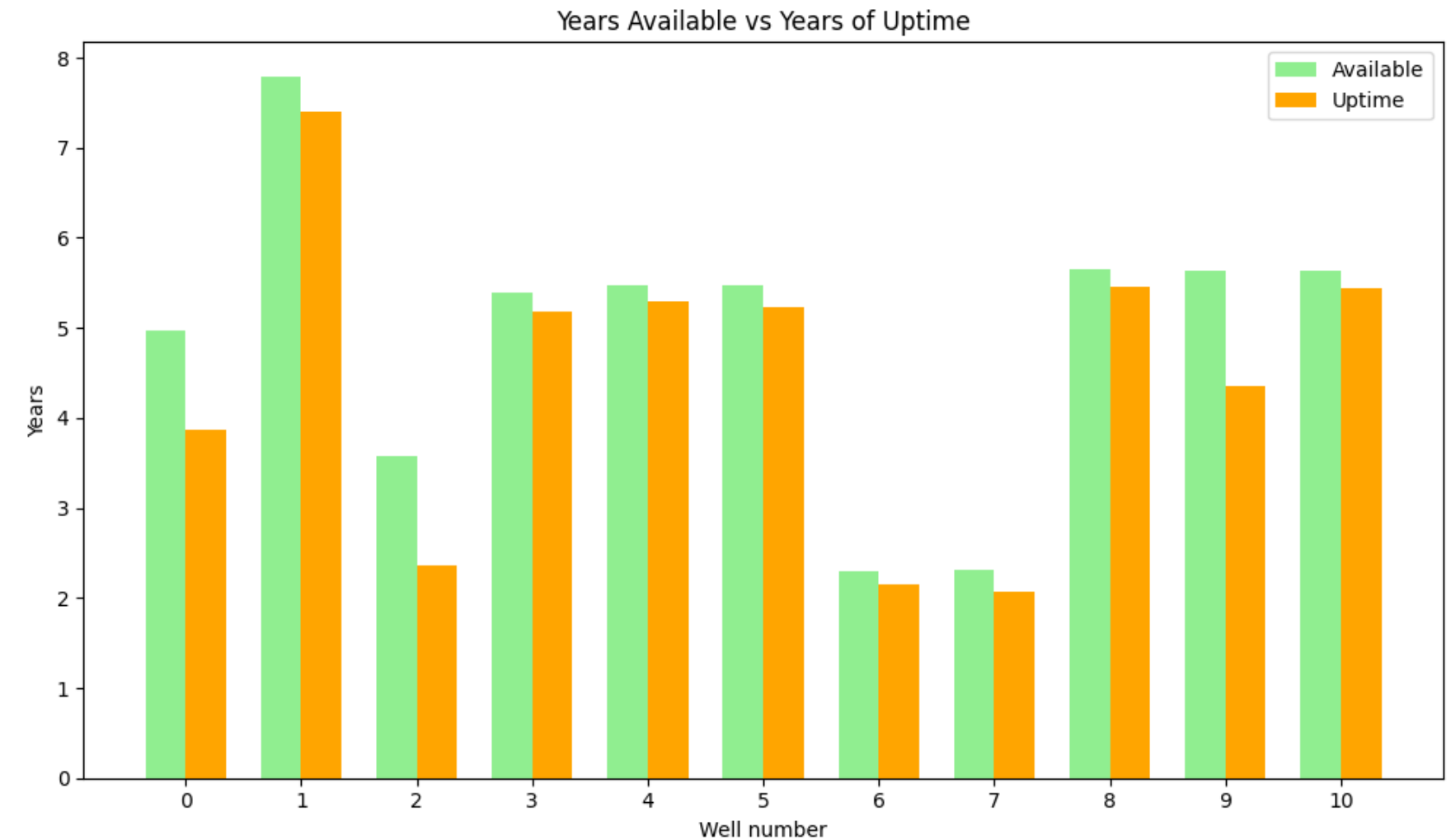
Components	Tag description	Tag name
Production Well	Wellhead pressure	GEOTHERMIE.G01.HPA.10.CP.030.MW
	Wellhead temperature	GEOTHERMIE.G01.HPA.10.CT.030.MW
	Flow rate	GEOTHERMIE.G01.HPA.10.CF.010.MW
ESP	Downhole pressure	
	Downhole temperature	
	Inlet pressure	GEOTHERMIE.YY1
	Inlet temperature	
	Flow rate	
	Outlet pressure	
	Outlet temperature	
	Motor temperature	
	Frequency	
	Voltage	
Degasser	Current	
	Pump head	
	Power Consumption	
	Vibration X direction	
	Vibration Y direction	
	Vibration Z direction	
	Pressure	GEOTHERMIE.XX1
	Level (%)	GEOTHERMIE.XX2
	Inlet liquid flow rate	GEOTHERMIE.XX3
	Outlet liquid flow rate	GEOTHERMIE.XX4
Heat exchanger	Outlet gas flow rate	
	Primary inlet temperature	
	Primary outlet temperature	
	Primary inlet pressure	
	Primary outlet pressure	



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Preliminary overview of the database

Name	Years Available	Years of Uptime	Uptime as a Percentage	Number of Shutins	Average Flowrate	Average Motor Temperature
Well1	4,96	3,87	77,9	25	179,40	88,18
Well2	7,78	7,4	95,0	17	253,48	99,20
Well3	3,58	2,37	66,1	21	202,52	100,53
Well4	5,39	5,17	96,1	26	173,72	81,30
Well5	5,47	5,3	96,9	20	127,63	91,03
Well6	5,47	5,23	95,6	17	209,48	97,16
Well7	2,3	2,15	93,7	8	67,95	-
Well8	2,31	2,06	89,3	20	250,68	85,88
Well9	5,64	5,45	96,6	17	187,65	-
Well10	5,64	4,35	77,2	19	171,34	50,81
Well11	5,64	5,43	96,4	16	177,71	76,04



Next Steps

- Finalize the data collection
- Meeting with operators to verify and validate the features extracted from the data
- Start with statistical and correlation analysis on the data