Meeting New Regulatory & Financial Challenges Through Asset Framework with Sigmafine

Presented by

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Conference Theme and Keywords

Agenda

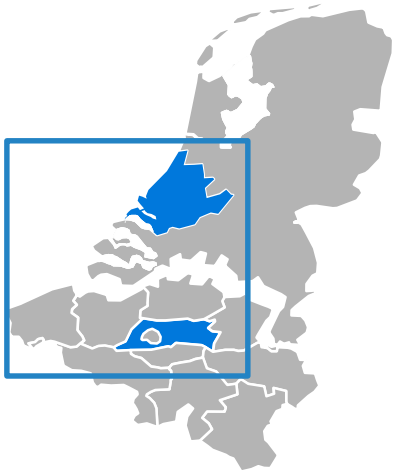
- About Uniper
- Business Challenge
- Solution
- Product Capabilities vs. Business Requirements
- Business Impact
- Summary & Lessons Learned

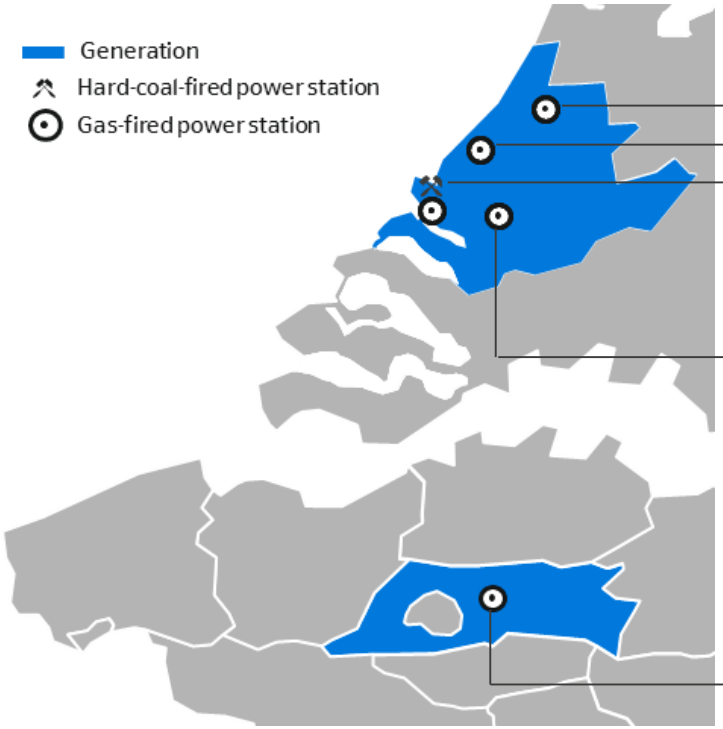
About the company

About Uniper

- Public Company Formerly E.ON / IPO Q3-2016
- Uniper Benelux (UBX)
  - Power & Heat generation
  - Sales B2C & B2B
  - Netherlands and Belgium
- 2 900 MW Installed capacity (UBX)
  - 2 100 MW Coal,
  - 800 MW Gas
- Dusseldorf ⇨ Short & Long term planning & optimization
- Rotterdam ⇨ Operations, Local power & heat dispatch, Sales

Uniper Benelux Generation





Leiden	82 MW
The Hague	114 MW
Maasvlakte	
MPP1	535 MW
MPP2	535 MW
MPP3	1065 MW
UCML	70 MW
RoCa	
RoCa 1	25 MW
RoCa 2	25 MW
RoCa 3	220 MW

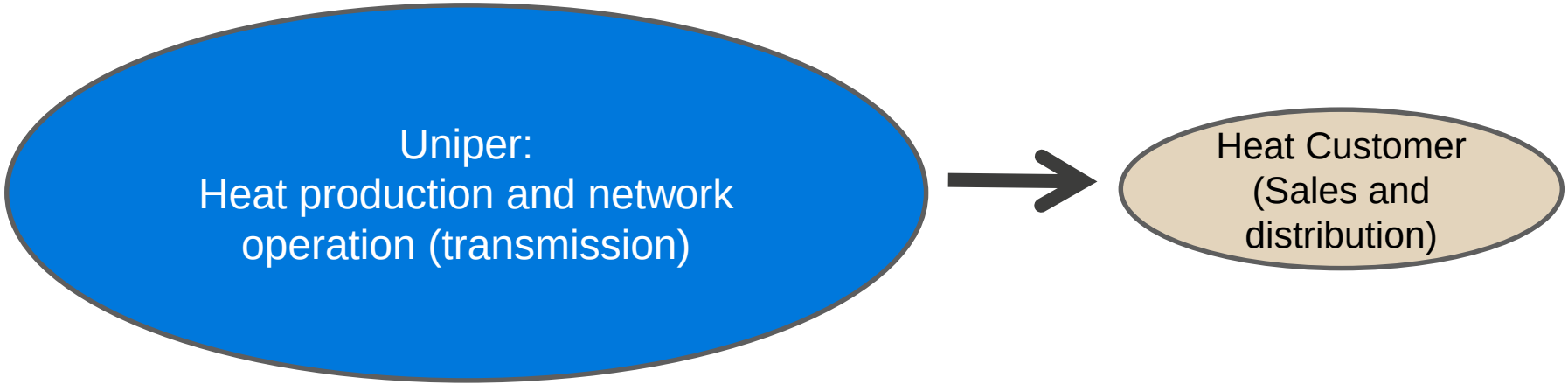
Vilvoorde	250 MW

Combined Heat & Power business

- Long term heat contracts
  - Delivery of heat
  - Operation of networks
- Single Heat Customer
- Multiple Heat Producers
- UBX Heat capacity
  - 500 MW CHP
  - 500 MW Heat Boilers

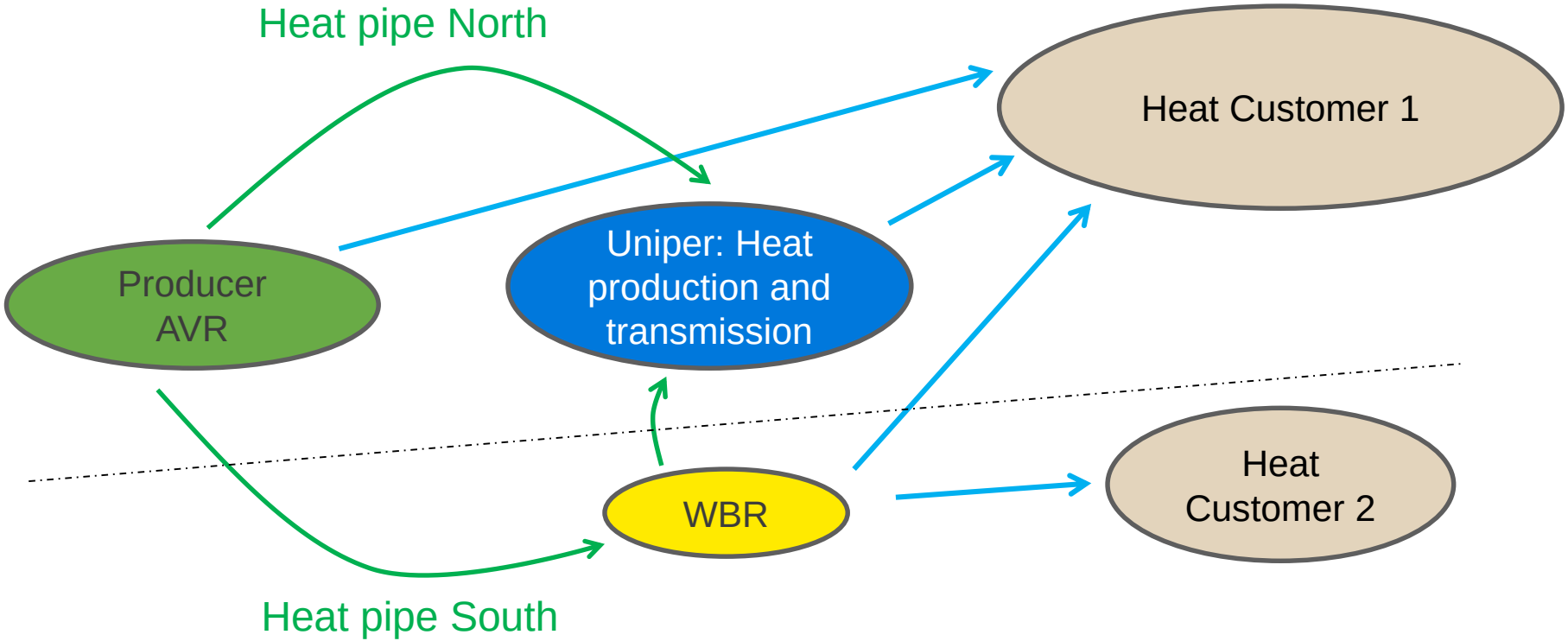
- Maasvlakte Co-siting

Changing position in Heat market



District Heating Rotterdam before 2014
- UBX had delivery commitment
- UBX was single producer

Changing position in Heat market



Operational & Business Challenges

UBX Business Environment

Hourly Validation

Gas Fuels

Coal

Liquid Fuels

Power

Heat

Steam

Multiple suppliers

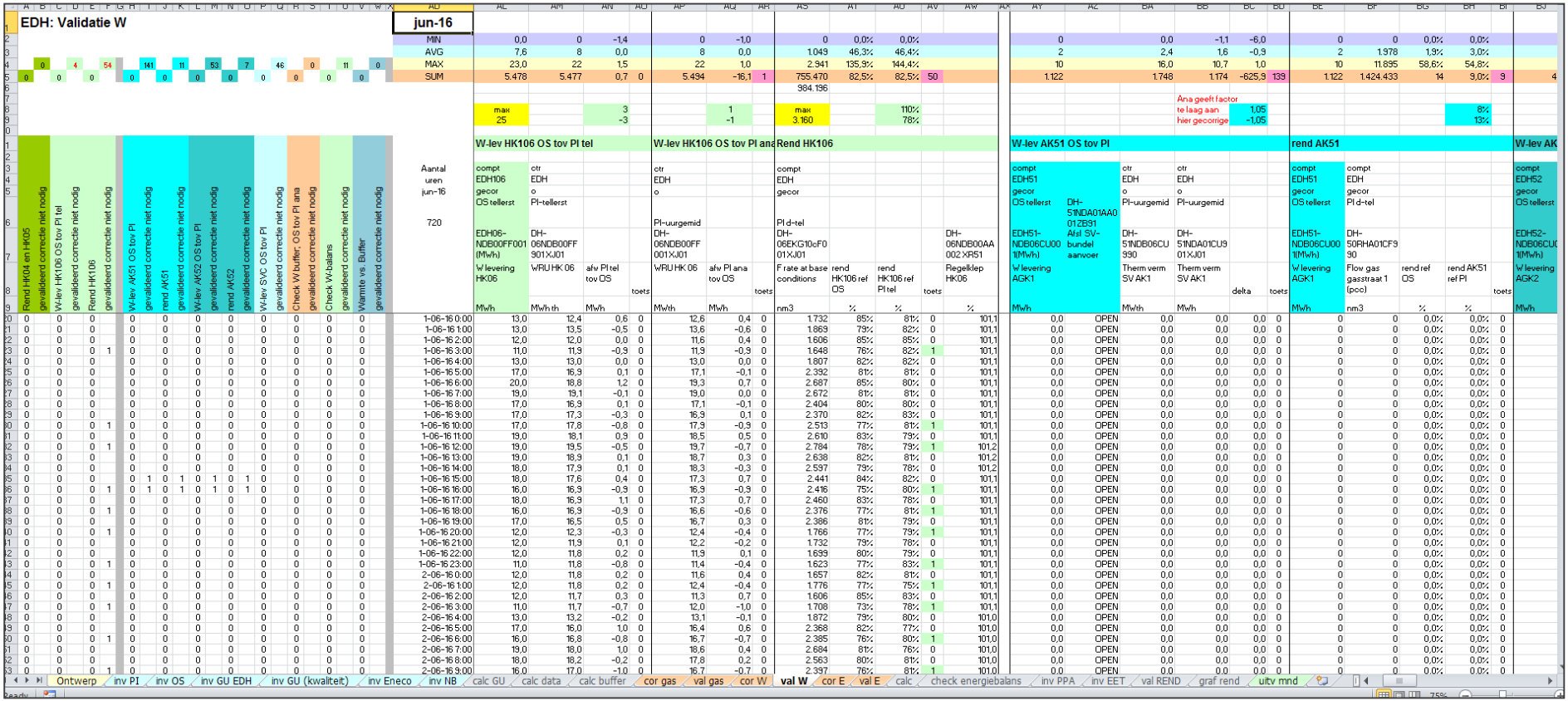
Multiple Generation Units & Scenarios

Many buyers

Uniper Operational Data Requirements

- UBX needs to validate (accountable, compliancy) process measurements:
  - 11 power transactions
  - 36 heat transactions
  - 10 validated emissions to air for city production sites
  - 3 validated heat loss to aqueous streams
- Approximate 150-250 internal measurements per site

Current way of validating generation data



Business Challenges

1. Improve response time (to market changes) / in validation process
2. Profit maximization based on balance of heat, power and steam
3. Timely provision of verified and auditable data to all trading partners
4. Operate within environmental permit limits

Solution

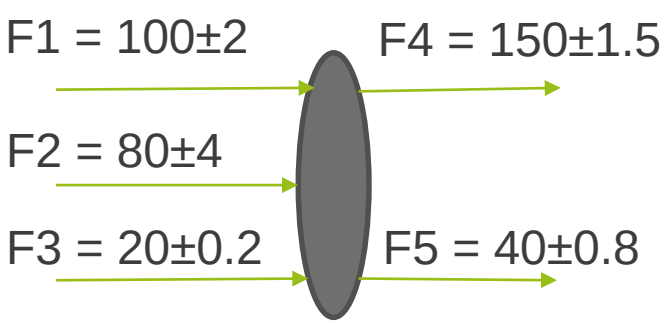
Technical Solution: PI System & Sigmafine

- PI AF - Structure the asset to meet business needs
- PI DataLink - Extract data to Excel
- PI Notification - Automate email notification for meters operating outside their validity
- PI ProcessBook: visualization of the asset based model

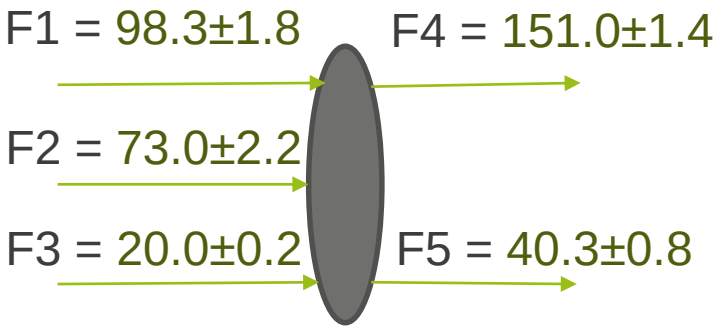
- SF Server
  - Energy Balance Calculation
  - Automatic Unit of Measure conversion
- SF Scheduler – Automation based validation & reconciliation periods (hourly, daily, monthly)

Uniper-Benelux Energy Balance

Power and Heat Market: Data quality needs

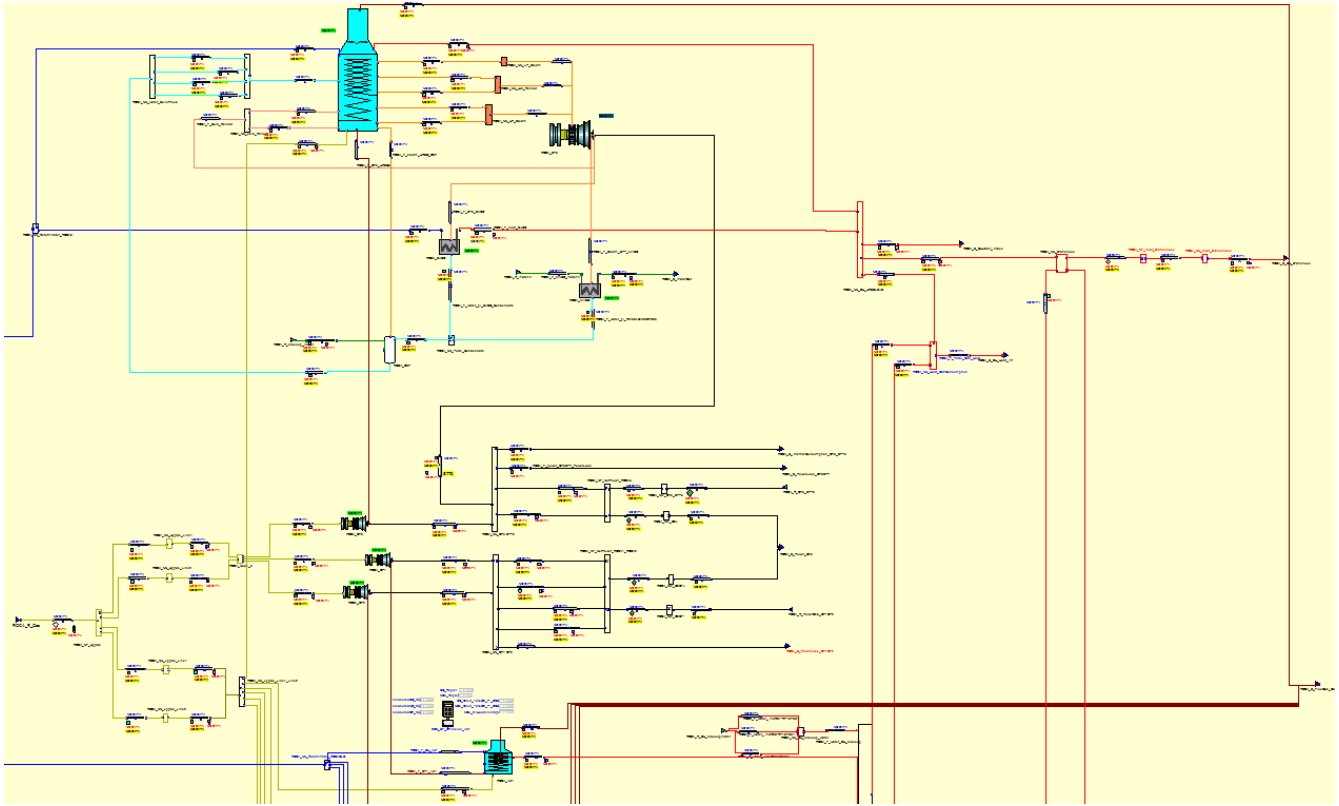


Measured Imbalance = +10



Reconciled Imbalance = 0

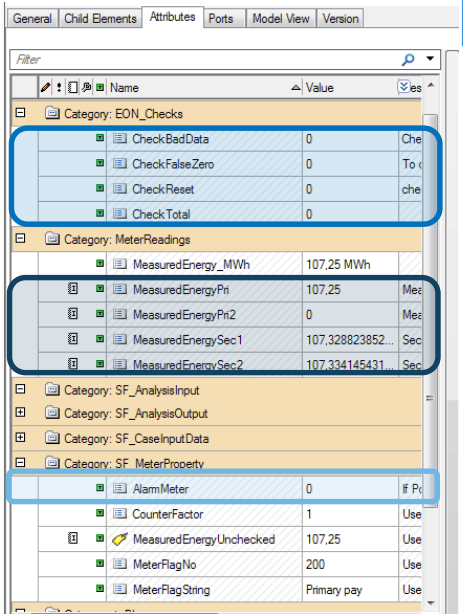
Energy Balance: Combined Power & Heat site



- Energy Balance
- Reconciled data
- Publish validated data
- Improve business and operational decisions

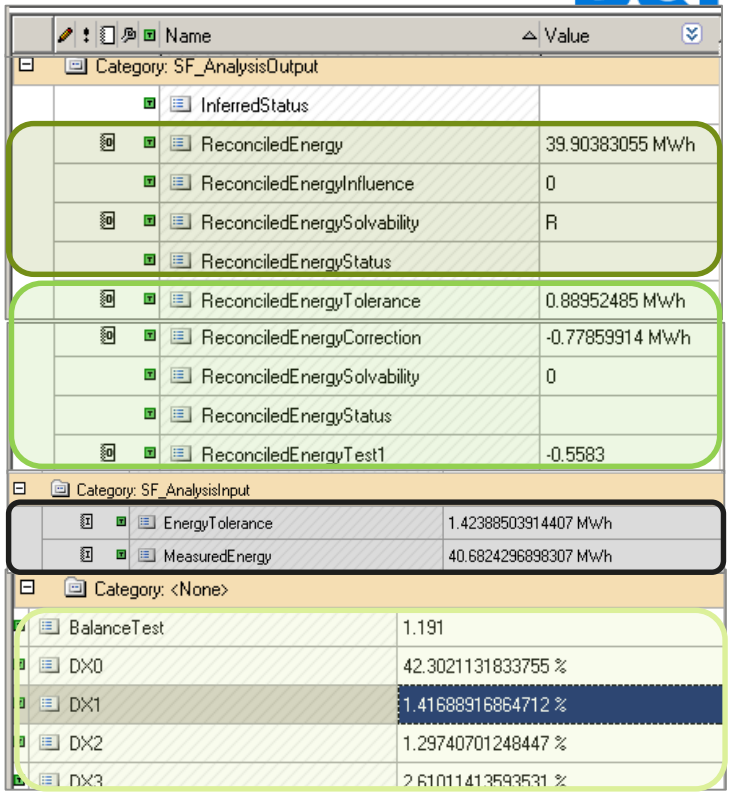
AF Structure - Input

1. PI AF attributes covers multiple measurements
2. PI AF attributes captures data scientist standard checks (delta violation, freezing, no data)
3. Uses OSIsoft PI Notifications sends alarm emails for important measurements errors (including emissions)

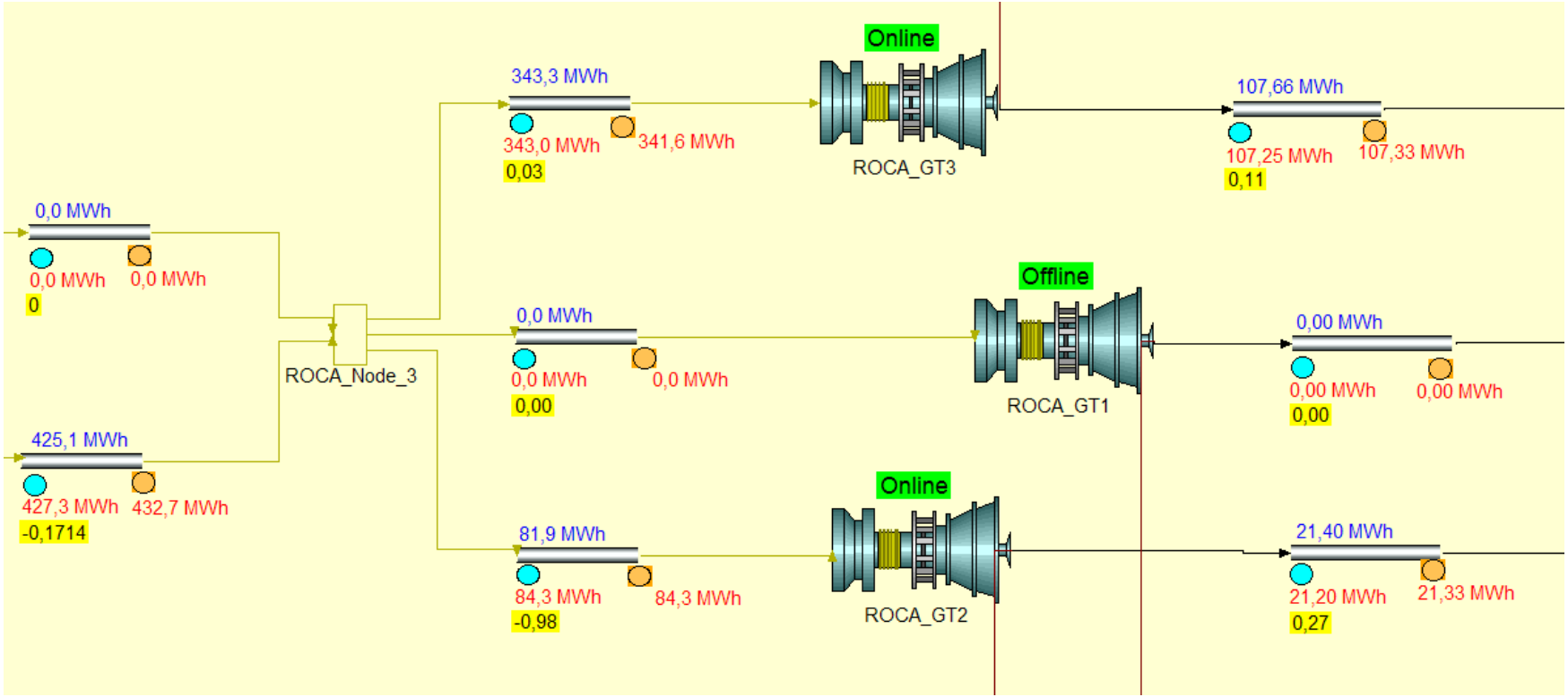


AF Structure - Output

1. Sigmafine calculates reconciled energy and associated tolerance
2. Sigmafine produces measurement data quality KPI for data scientist
3. Sigmafine produces balance point quality KPI for Operations manager



Making data trustable: The Sigmafine way



Energy balance

Before

- Balances are calculated in excel using PI DataLink
- Separate boundary balance (gas or power or heat)
- Manual repairs or alternative meter selection for missing values/errors
- Process monthly interval

Now

- Sigmafine integrates natively to PI System
- Single energy balance model with data reconciliation containing all process units (gas, power, heat)
- All data sources (PI Server & external) considered in model
- (Near-) real time balance

Business Impact

- **Operations Benefits**
  - Monthly → Daily (intraday) Balancing
  - Timely validated operations data with financial impact
  - Daily maximization of heat dispatching
  - Faster Billing & Reporting to customers
- **Financial Benefits**
  - Power/heat optimization valued to approx. 4%-6% of heat contract value
  - Expected €300-500 k annually

*Optimize the heat optimization and dispatch also depending on other parallel projects

Life of the Data Custodians

Before	After
Manual and Time consuming monthly data validation process	Daily automatic data validation and reconciliation
Manual data import from different sources (PI Server, TSO, Gas grid)	Automatic import into Sigmafine from all the data sources
Manual identification and resolution of data gaps, meter defects	Automatic data correction
Manual selection of the “best” redundant measurements points	Automatic filtering and selection of the best measured data
Time spent to resolve “Ambiguities” related to Compliance and Billing (consumption & production)	Faster, **validated** view on financial impact of operations

Improve integrity of Business Process by delivering timely & accurate information

COMPANY and GOAL

UBX performance engineering department is responsible for processing, validating, correcting and releasing unambiguous generation data

CHALLENGE

Current manual work processes limits the data availability to monthly intervals

- Time consuming data processing with manual corrections
- Lack of focus on data and metering quality

SOLUTION

Combining PI AF and Sigmafine to automate data validation and reconciliation

- Hourly intervals combining different data sources
- Pre programmed model runs to match delays of availability

RESULTS

Single source of truth for generation data, available at shorter intervals/delays

- Data version capture made available company wide for reporting, invoicing, business analyses
- Increasing data quality over versions

Tangible Improvement of the outcome of Business Process &Decisions

COMPANY and GOAL

UBX Heat business under stress of declining margins. Unambiguous generation data increasingly important for steering business dispatch/operations

CHALLENGE

Suboptimal heat operation/ dispatch due to lack in clear view of financial impact decisions

- Ambiguous data availability
- 1 month delay of validated ‘fiscal’ data
- No link between operation decisions and finance

SOLUTION

Implementing automated data validation and reconciliation system

- Single source of truth available within 1 day
- Automatic reports with actual financial impact of operations/ dispatch

RESULTS

Improvement opportunity (300-500 k€ annually)

- Improve short term operations/dispatch
- Faster invoicing, limiting amounts outstanding
- Linking operational decisions to financial results

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Questions

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State your **name & company**

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谢谢

Danke

Gracias

Merci

Thank You

ありがとう

Спасибо

Obrigado