# Meeting New Regulatory & Financial Challenges Through Asset Framework with Sigmafine

Presented by

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# Conference Theme and Keywords

# Agenda

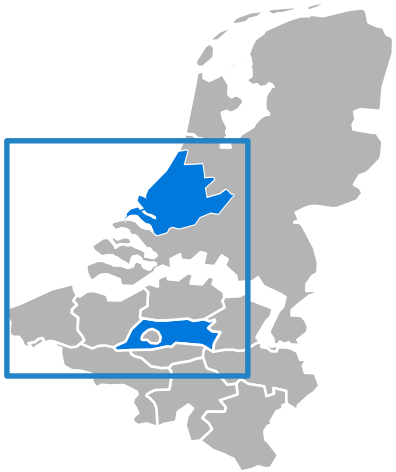
- About Uniper
- Business Challenge
- Solution
- Product Capabilities vs. Business Requirements
- Business Impact
- Summary & Lessons Learned

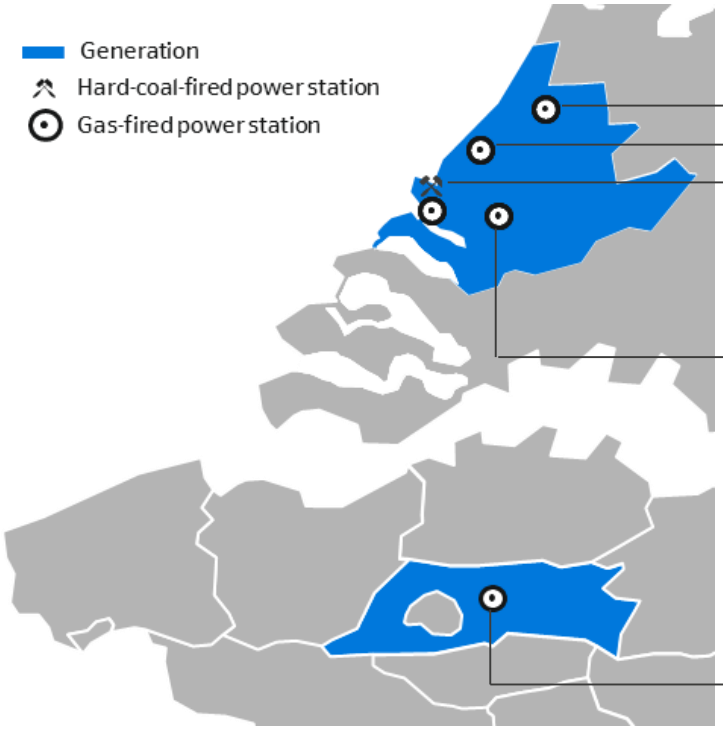
# About the company

# 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 |

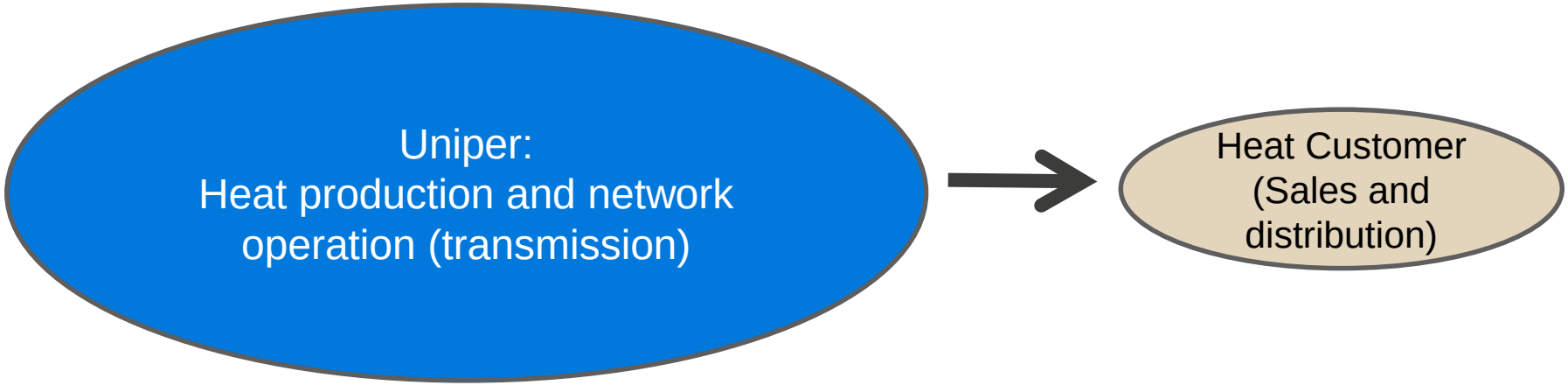
| | |
|---|---|
| Vilvoorde | 250 MW |

# 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

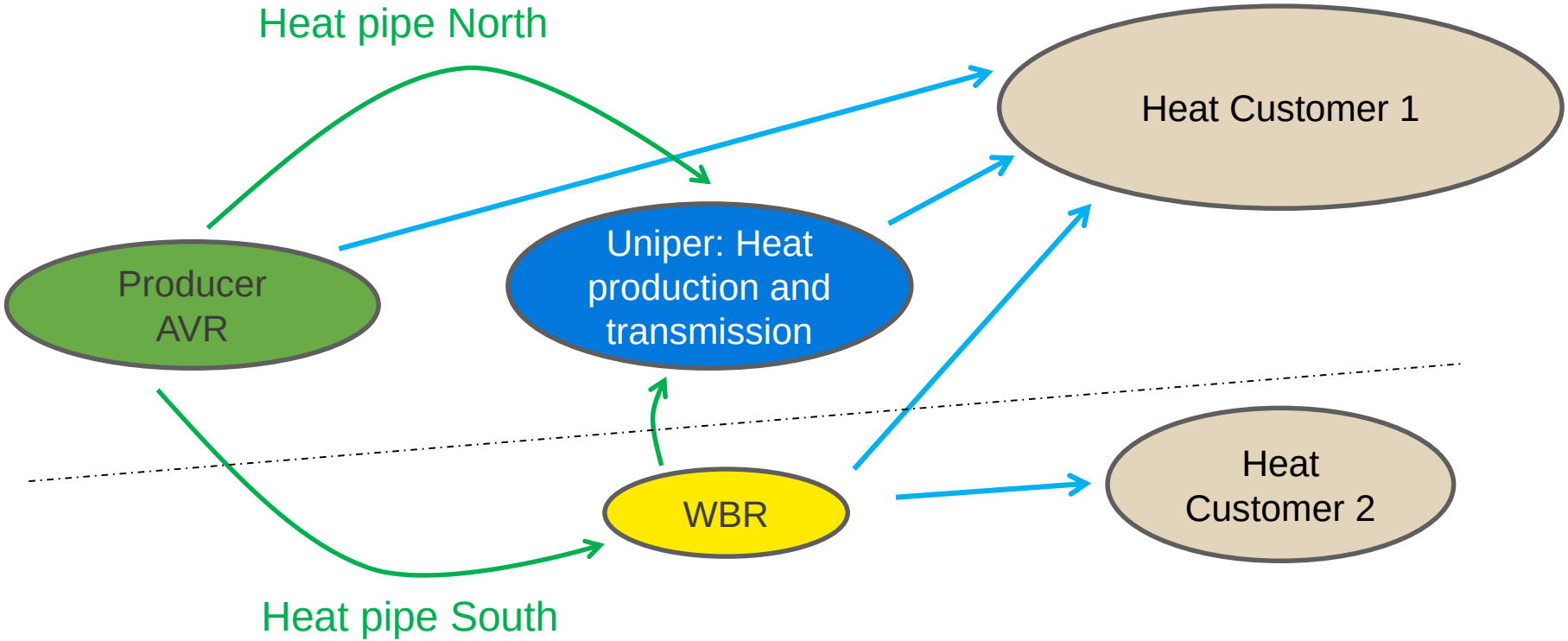
- Maasvlakte Co-siting

# 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**

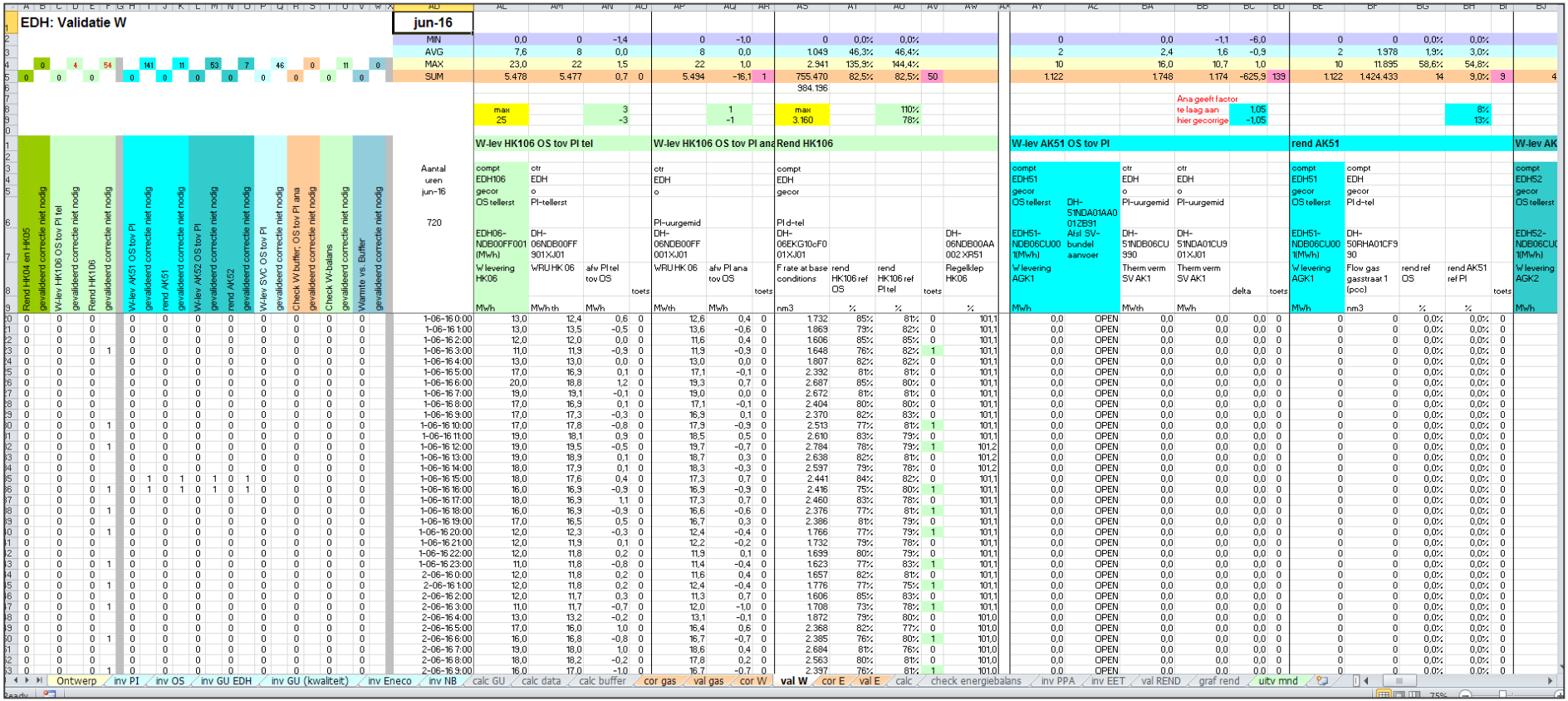
**Multiple Generation Units & Scenarios**

**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

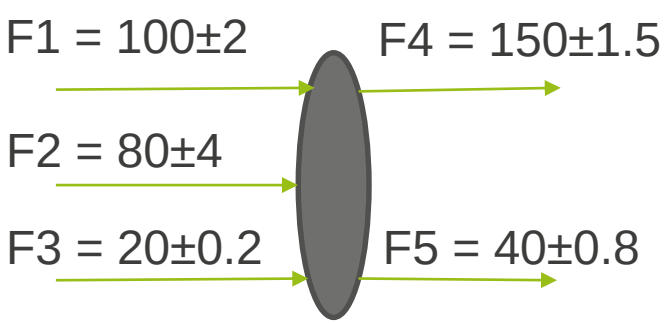
# Technical Solution: PI System & Sigmafine

- 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

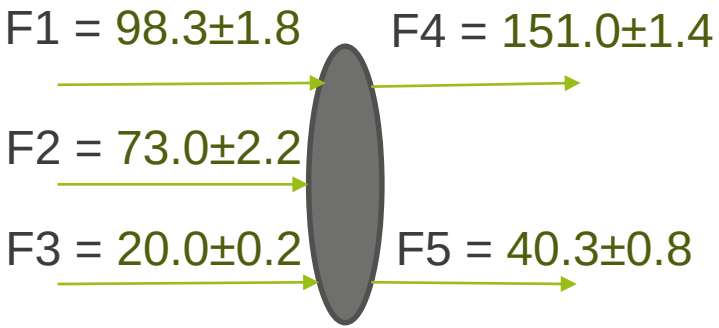
- SF Server
  - Energy Balance Calculation
  - Automatic Unit of Measure conversion
- SF Scheduler – Automation based validation & reconciliation periods (hourly, daily, monthly)

# Uniper-Benelux Energy Balance

# Power and Heat Market: Data quality needs

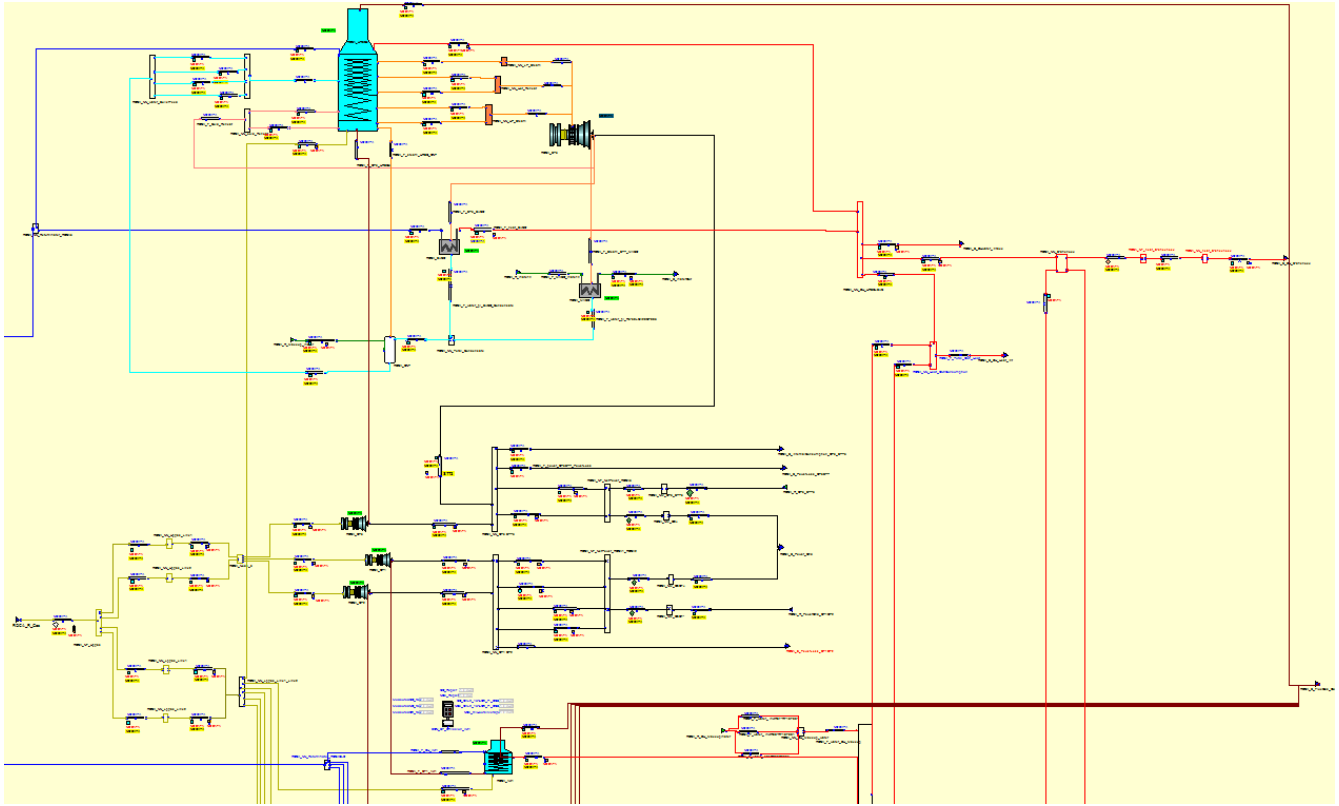




Measured Imbalance = +10




Reconciled Imbalance = 0

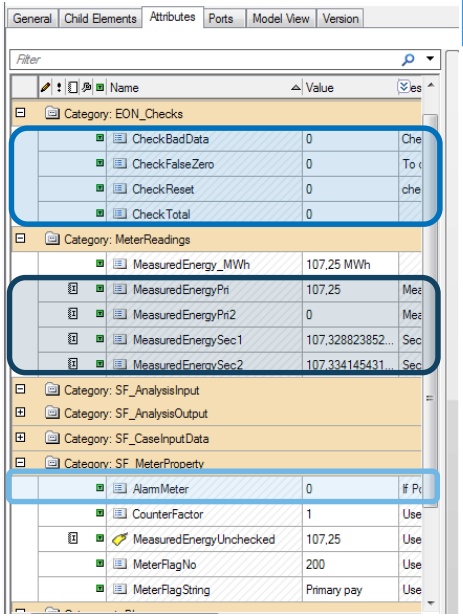
# Energy Balance: Combined Power & Heat site



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

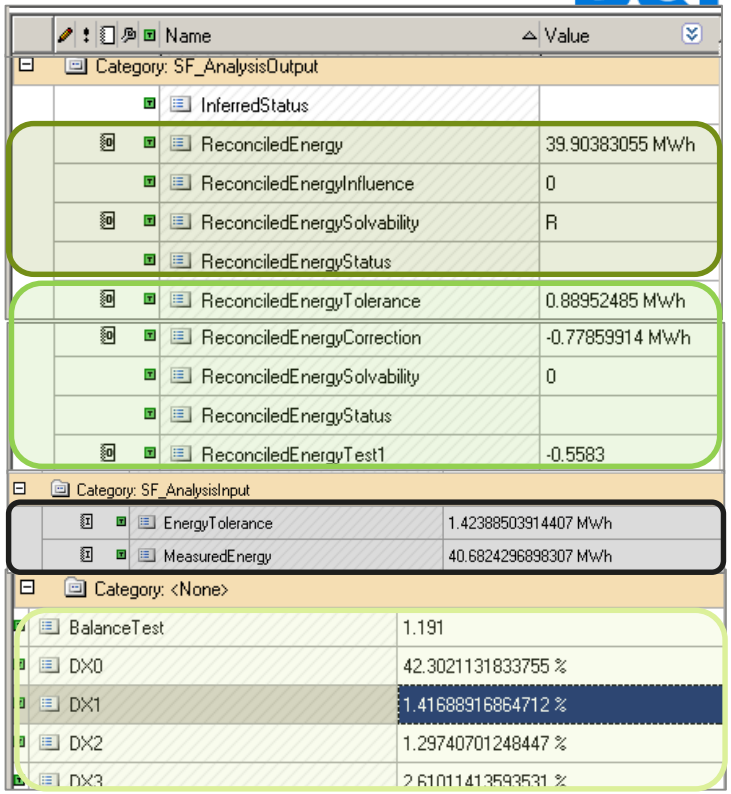
# AF Structure - Input

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)

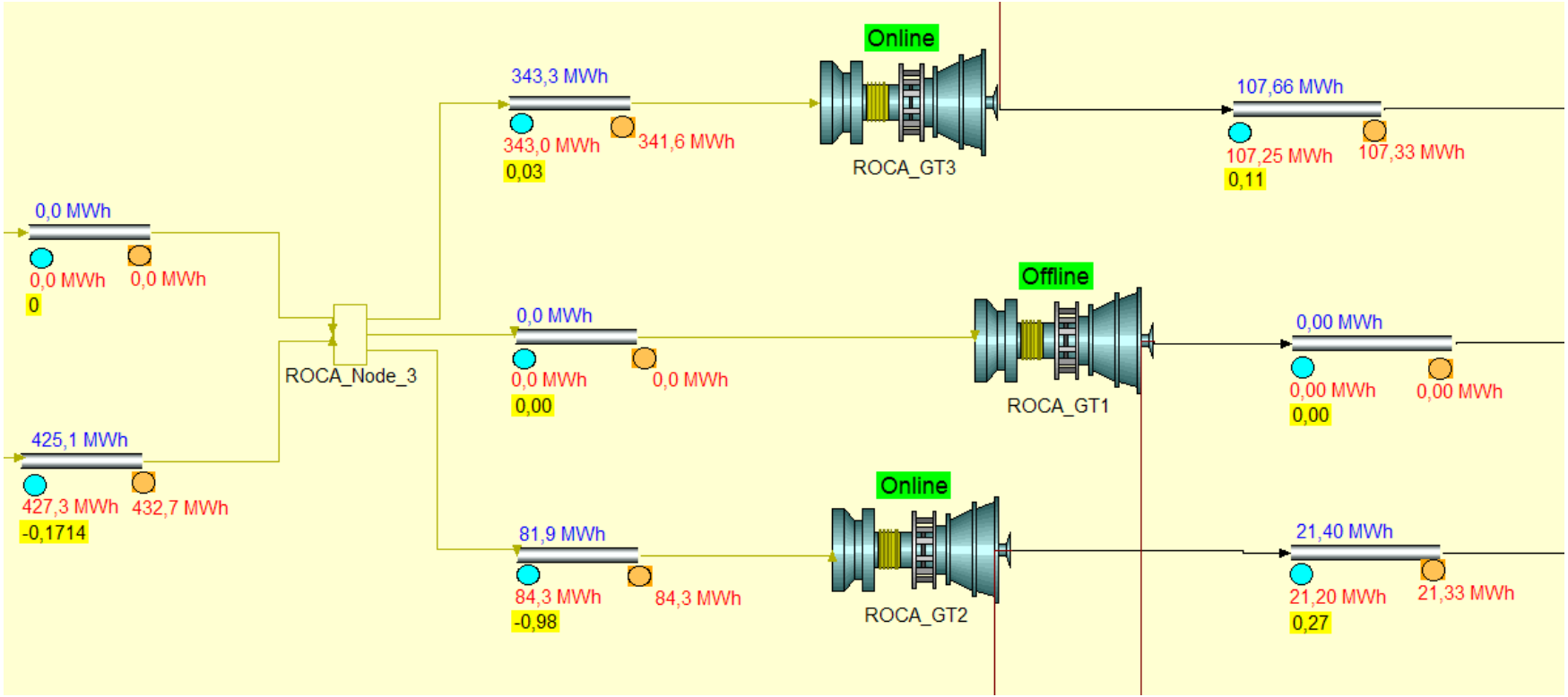


# AF Structure - Output

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

# Contact Information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# Questions

Please wait for the **microphone** before asking your questions

State your **name & company**

# Please remember to…

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감사합니다

谢谢

Danke

Gracias

Merci

# Thank You

ありがとう

Спасибо

Obrigado