



From Science to Application with the TOP-Energy Software Framework

Society for the Advancement of Applied Computer Science

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- Non-Profit Research Organisation
- Staff: 101
- Founded: 1990
- Member of the AiF e.V.
Programme Manager of Cornet in Germany
- Associated Institute of “Beuth University”
and “University of Applied Science” Berlin

Departments

- Signal Processing / Acoustic Camera
- Image Processing / Industrial Applications
- Image Processing / Document Analysis
- Graph Based Engineering Systems
- 3D-Data Processing
- Computer Aided Facility Management

Products (examples)

- Acoustic Camera
- Noise Image
- 3D Registthree
- Final Surface
- SCHARS Web
- Quicksteps
- TOP-Energy
- InfoCABLE
- ...



Energy Audits / Initial Analysis

Questionnaire

Please return to:

Official use only	
Date Received:	
Company ID:	

Operating Data Analysis year: Collection date:

Company Name	
Company Address	
Telephones, Fax	Tel.: Fax:
Contact Person and Title
Department
Telephone, Fax	Tel.: Fax:
Email	Email:
Energy person	<input type="checkbox"/> no <input type="checkbox"/> yes, Name:
	Tel.: Email:
Quality assurance Person	<input type="checkbox"/> no <input type="checkbox"/> yes, Name:
	Tel.: Email:
Type of Business	
Typical Reporting Data eg. Units produced, Product Volume /annum, Number of Beds, etc.)	
Turnover (Budgeted Turnover)	AUD per year Year:
Profit:	AUD per year Year:
Number of Employees	Total: Administration:
	Production: Per Shift:
Working Hours	Shifts per Day: Days per Week:
Company Holiday	<input type="checkbox"/> no <input type="checkbox"/> yes, from: to:
Building	Total Work Area*:
	Production: m ² Warehouse: m ²
	Administration: m ² m ²
	m ² m ²
Certifications	<input type="checkbox"/> EU-Öko-Audit <input type="checkbox"/> ISO 14.000 ff
	<input type="checkbox"/> ISO 9.001 <input type="checkbox"/> Others:

* With several floors the respective floors are to be added.
(As per DIN 2774 "Grundflächen und Rauminhalte von Bauwerken im Hochbau")

Questionnaire Page 1



5 ENERGIERELEVANTE KOSTEN

5.1 BEZUGSKOSTEN

In Abbildung "Bezugskosten nach Energieträgern und Medien" sind die Kosten der jeweiligen Energieträger aufgeschlüsselt. In der folgenden Abbildung ist die prozentuale Aufteilung dargestellt. Der größte Kostenträger im Bereich Energie (inkl. Wasser) stellt ggü. Bezug von Strom dar. Die gesamten energierelevanten Kosten (inkl. Wasserbezug und -erwärmung) betragen sich pro Jahr auf 366.600 EUR/a.

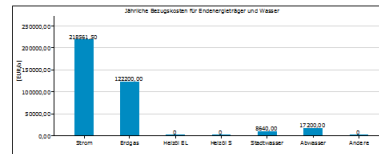


Abbildung 6: Bezugskosten nach Energieträgern und Medien

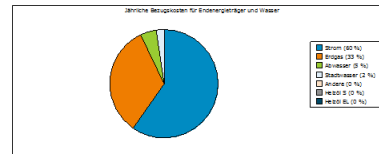


Abbildung 7: Prozentuale Aufteilung der Bezugskosten

17. März 2015

Seite 11

Energy Audits / Initial Analysis

Questionnaire

Please return to: _____

Client site only
Date Received: _____

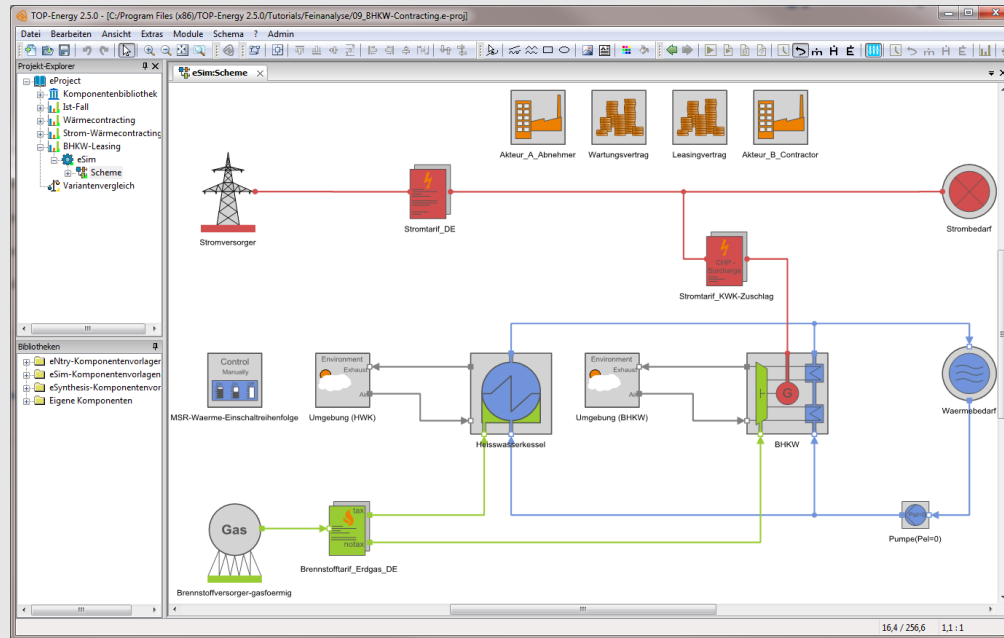
Operating Data Analysis year: _____

Company Name
Company Address
Telephons, Fax
Contact Person and Title
Department
Telephone, Fax
Email
Energy person
Quality assurance Person
Type of Business
Typical Reporting Data
eg. Units produced,
Product Volume /annum,
Number of Beds, etc.)
Turnover (Budgeted Turnover)
Profit:
Number of Employees
Working Hours
Company Holiday
Building
Certifications
* With several floors the respective floors are to be added.
(As per DIN 2774 "Grundflächen und Rauminhalte von Bauwerken in
Questionnaire Page 1

5 ENERGIERELEVANTE KOSTEN



Simulation & Optimisation



Energy Audits / Initial Analysis

Questionnaire

Please return to: _____

Date Received: _____

Operating Data Analysis year: _____

Company Name _____
 Company Address _____
 Telephone, Fax _____
 Contact Person and Title _____
 Department _____
 Telephone, Fax _____
 Email _____

Energy person no yes, Name _____
 Quality assurance Person no yes, Name _____

Type of Business _____
 Typical Reporting Data
 eg. Units produced, _____
 Product Volume / annum, _____
 Number of Beds, etc.) _____

Turnover (Budgeted Turnover) _____ ALID per year
 Profit: _____ ALID per year

Number of Employees: Total: _____
 Production: _____
 Working Hours: Shifts per Day: _____
 Company Holiday no yes, from _____

Building: Total Work Area: _____
 Production: _____
 Administration: _____

Certifications EU-Oko-Audit ISO 9.001

* With several floors the respective floors are to be added.
 (As per DIN 2774 "Grundflächen und Rauminhalte von Gebäuden")

Questionnaire Page 1

5 ENERGIERELEVANTE KOSTEN

Simulation & Optimisation

TOPEnergy 2.5.0 - [C:\Program Files (x86)\TOP-Energy 2.5.0\Tutorials\Feinanalyse\09_BHKW-Contracting-e-proj]

Projekt-Explorer

- eProject
 - Komponentenbibliothek
 - Ist-Fall
 - Wärmecontracting
 - Strom-Wärmecontracting
 - BHKW-Leasing
 - eSim
 - Schema
 - Variantevergleich

Bibliotheken

- eNty-Komponentenvorlager
- eSim-Komponentenvorlagen
- eSynthesis-Komponentenvor
- Eigene Komponenten

Stromversorger

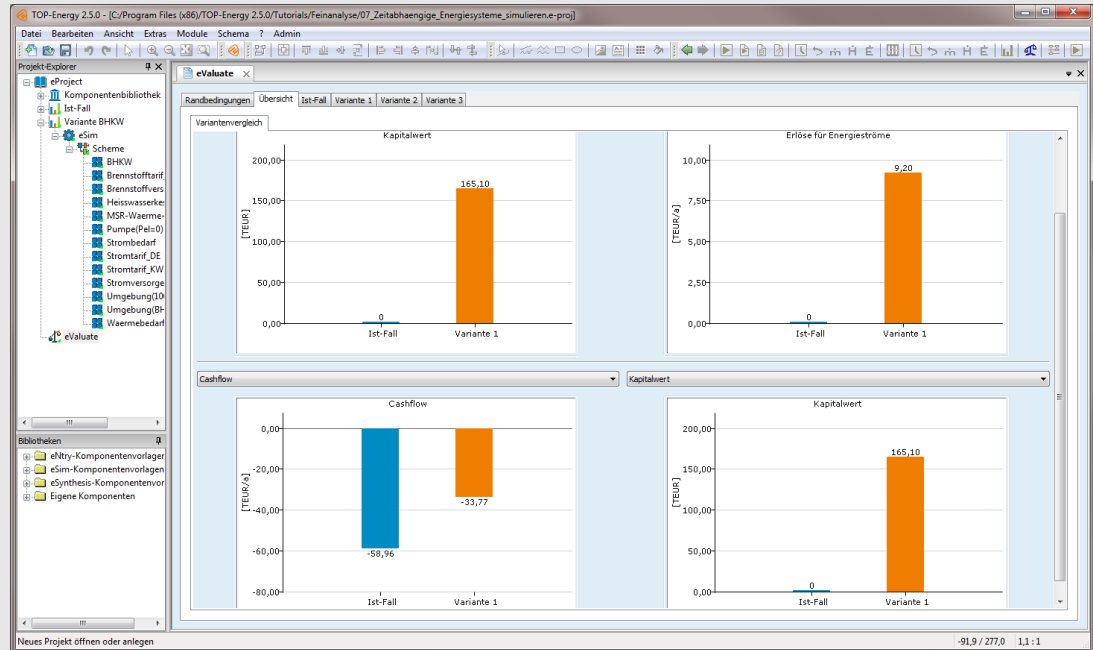
Control

MSR-Waerme-Einschaltreihenfolge

Gas

Brennstoffversorger-gasformig

Economic and Ecologic Evaluation



ENGINEERING TIMESERIES ANALYSER



Import of Raw Data

Importieren von Daten - Messdaten_elektrisch.txt

Vorschau:

Datum	Zeit	EI A	EI B
03.01.2008	15:15	1606364,666	
03.01.2008	15:30	1606367,047	
03.01.2008	15:45	1606368,874	
03.01.2008	16:00	1606370,811	
03.01.2008	16:15	1606372,417	
03.01.2008	16:30	1606374,465	
03.01.2008	16:45	1606376,402	
03.01.2008	17:00	1606378,727	
03.01.2008	17:15	1606380,333	
03.01.2008	17:30	1606382,326	
03.01.2008	17:45	1606384,319	
03.01.2008	18:00	1606386,422	
03.01.2008	18:15	1606388,581	
03.01.2008	18:30	1606390,851	
03.01.2008	18:45	1606392,788	
03.01.2008	19:00	1606395,003	
03.01.2008	19:15	1606397,051	
03.01.2008	19:30	1606399,431	
03.01.2008	19:45	1606401,258	
03.01.2008	20:00	1606403,306	
03.01.2008	20:15	1606405,189	
03.01.2008	20:30	1606407,403	
03.01.2008	20:45	1606409,507	
03.01.2008	21:00	1606411,721	
03.01.2008	21:15	1606413,437	
03.01.2008	21:30	1606415,374	
03.01.2008	21:45	1606417,146	
03.01.2008	22:00	1606419,25	
03.01.2008	22:15	1606420,91	
03.01.2008	22:30	1606422,903	
03.01.2008	22:45	1606424,675	
03.01.2008	23:00	1606426,834	
03.01.2008	23:15	1606428,66	
03.01.2008	23:30	1606430,764	
03.01.2008	23:45	1606432,536	
04.01.2008	00:00	1606434,639	
04.01.2008	00:15	1606436,411	
04.01.2008	00:30	1606438,514	
04.01.2008	00:45	1606440,286	
04.01.2008	01:00	1606442,555	
04.01.2008	01:15	1606444,382	

Trennzeichen: TAB

Lade Datei Weiter-->

Rohdaten:

	A	B	C	D
1	Datum	Zeit	EI A	EI B
2	03.01.2008	15:15	1606364,666	285335,2517
3	03.01.2008	15:30	1606367,047	285337,6321
4	03.01.2008	15:45	1606368,874	285339,4589
5	03.01.2008	16:00	1606370,811	285341,3964
6	03.01.2008	16:15	1606372,417	285343,0018
7	03.01.2008	16:30	1606374,465	285345,0501
8	03.01.2008	16:45	1606376,402	285346,9876
9	03.01.2008	17:00	1606378,727	285349,3127
10	03.01.2008	17:15	1606380,333	285350,918
11	03.01.2008	17:30	1606382,326	285352,9109
12	03.01.2008	17:45	1606384,319	285354,9038
13	03.01.2008	18:00	1606386,422	285357,0075
14	03.01.2008	18:15	1606388,581	285359,1664

Äquidistante Zeitreihen?

Zeitzone: (GMT+01:00) Amsterdam, Berlin, Bern, Brüssel, Me

Datum: Format: DD.MM.YYYY Spalte: A

Zeit: Format: H:mm Spalte: B

letzter Zeitabschnitt: 15 Minuten

Datenbereich: Startzeile: 2 Spalte: C Endzeile: 33526 Dezimalzeichen: ,

Weiter-->

Zeitreihen:

	A	B	C
1	03.01.2008	15:15	1606364,666
2	03.01.2008	15:30	1606367,047
3	03.01.2008	15:45	1606368,874
4	03.01.2008	16:00	1606370,811
5	03.01.2008	16:15	1606372,417
6	03.01.2008	16:30	1606374,465
7	03.01.2008	16:45	1606376,402
8	03.01.2008	17:00	1606378,727
9	03.01.2008	17:15	1606380,333
10	03.01.2008	17:30	1606382,326
11	03.01.2008	17:45	1606384,319
12	03.01.2008	18:00	1606386,422
13	03.01.2008	18:15	1606388,581
14	03.01.2008	18:30	1606390,851
15	03.01.2008	18:45	1606392,788
16	03.01.2008	19:00	1606395,003
17	03.01.2008	19:15	1606397,051
18	03.01.2008	19:30	1606399,431
19	03.01.2008	19:45	1606401,258
20	03.01.2008	20:00	1606403,306
21	03.01.2008	20:15	1606405,189
22	03.01.2008	20:30	1606407,403
23	03.01.2008	20:45	1606409,507
24	03.01.2008	21:00	1606411,721
25	03.01.2008	21:15	1606413,437
26	03.01.2008	21:30	1606415,374
27	03.01.2008	21:45	1606417,146
28	03.01.2008	22:00	1606419,25

Zeitreihenname: Messdaten_elektrisch_EI A

Einheit:

Abbrechen Weiter-->

ENGINEERING TIMESERIES ANALYSER



Import of Raw Data

Importieren von Daten - Messdaten_elektrisch.txt

Vorschau:

Datum	Zeit	E1 A	E1 B
03.01.2008	18:15	1606354.666	
03.01.2008	18:30		
03.01.2008	18:45		
03.01.2008	19:00		
03.01.2008	19:15		
03.01.2008	19:30		
03.01.2008	19:45		
03.01.2008	20:00		
03.01.2008	20:15		
03.01.2008	20:30		
03.01.2008	20:45		
03.01.2008	21:00		
03.01.2008	21:15		
03.01.2008	21:30		
03.01.2008	21:45		
03.01.2008	22:00		
03.01.2008	22:15		
03.01.2008	22:30		
03.01.2008	22:45		
03.01.2008	23:00		
03.01.2008	23:15		
03.01.2008	23:30		
03.01.2008	23:45		
04.01.2008	00:00		
04.01.2008	00:15		
04.01.2008	00:30		
04.01.2008	00:45		
04.01.2008	01:00		
04.01.2008	01:15		

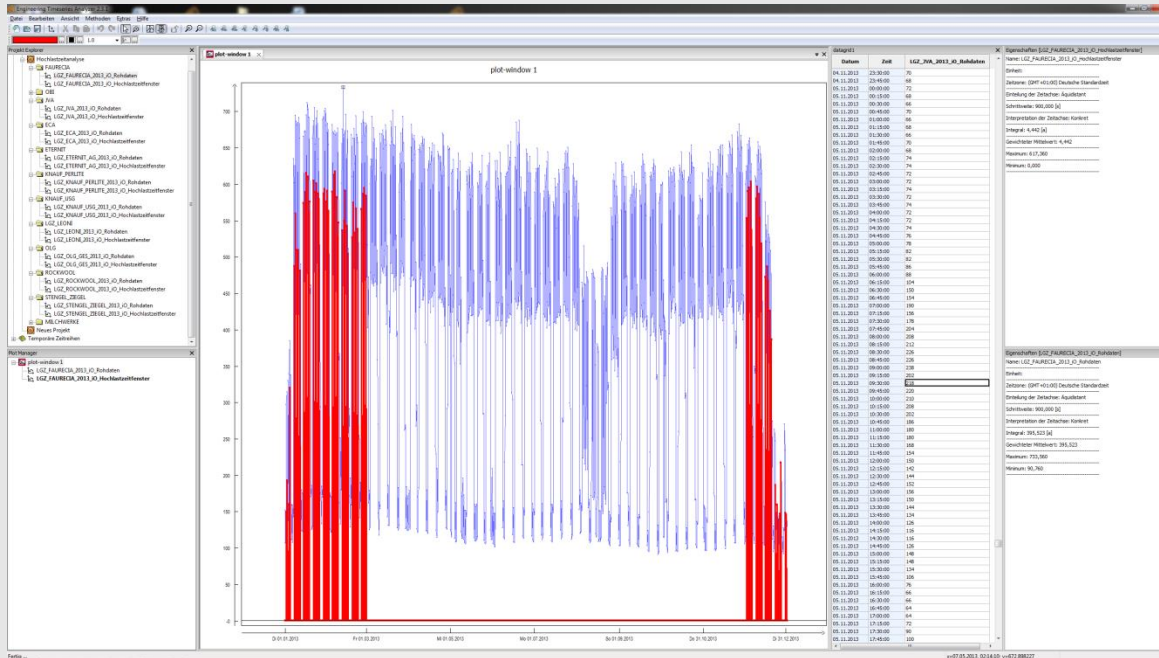
Rohdaten:

A	B	C	D

Zeitreihen:

A	B	C

Analysis of Measured Data



ENGINEERING TIMESERIES ANALYSER



Import of Raw Data

Importieren von Daten - Messdaten_elektrisch.txt

Vorschau: Rohdaten: Zeitreihen:

Datum	Zeit	E[A]	E[B]
03.01.2008	15:15	1606354.666	
03.01.2008	15:30		
03.01.2008	15:45		
03.01.2008	16:00		
03.01.2008	16:15		
03.01.2008	16:30		
03.01.2008	16:45		
03.01.2008	17:00		
03.01.2008	17:15		
03.01.2008	17:30		
03.01.2008	17:45		
03.01.2008	18:00		
03.01.2008	18:15		
03.01.2008	18:30		
03.01.2008	18:45		
03.01.2008	19:00		
03.01.2008	19:15		
03.01.2008	19:30		
03.01.2008	20:00		
03.01.2008	20:15		
03.01.2008	20:30		
03.01.2008	20:45		
03.01.2008	21:00		
03.01.2008	21:15		
03.01.2008	21:30		
03.01.2008	21:45		
03.01.2008	22:00		
03.01.2008	22:15		
03.01.2008	22:30		
03.01.2008	22:45		
03.01.2008	23:00		
03.01.2008	23:15		
03.01.2008	23:30		
03.01.2008	23:45		
04.01.2008	00:00		
04.01.2008	00:15		
04.01.2008	00:30		
04.01.2008	00:45		
04.01.2008	01:00		
04.01.2008	01:15		

Analysis of Measured Data

Importieren von Daten - Messdaten_elektrisch.txt

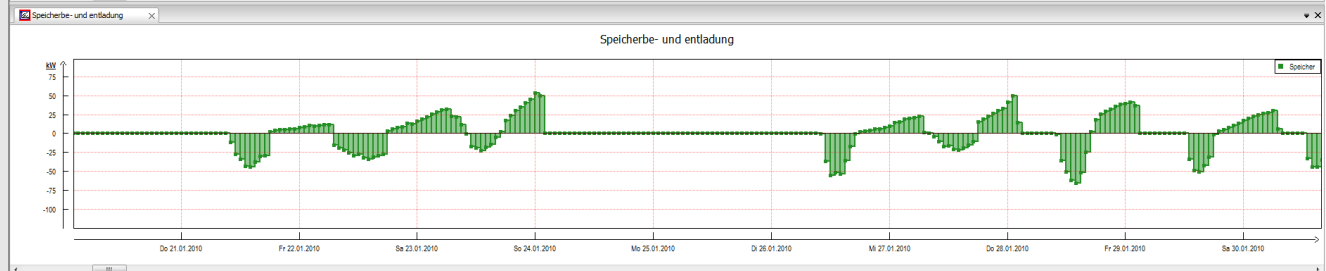
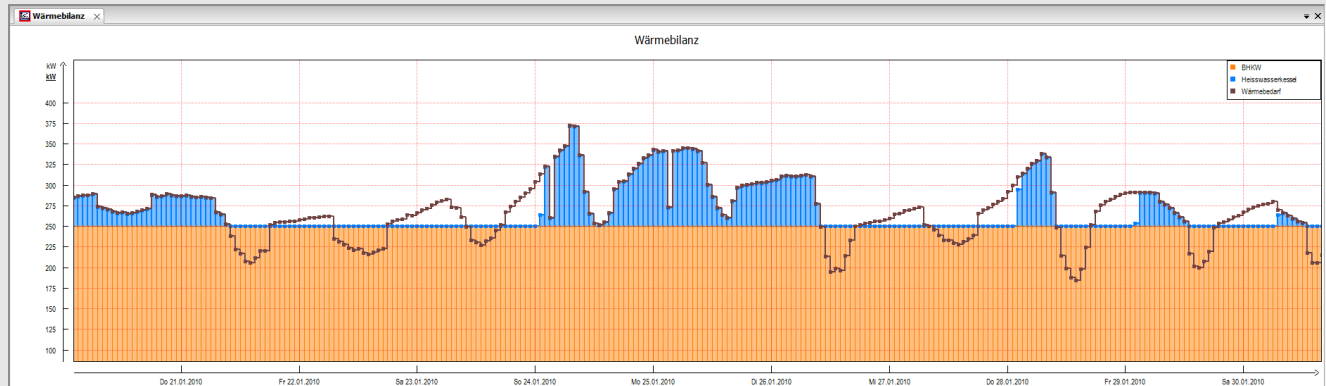
Vorschau: Rohdaten: Zeitreihen:

Trennzeichen: TAB

Lade Datei



Analysis of Simulation Results

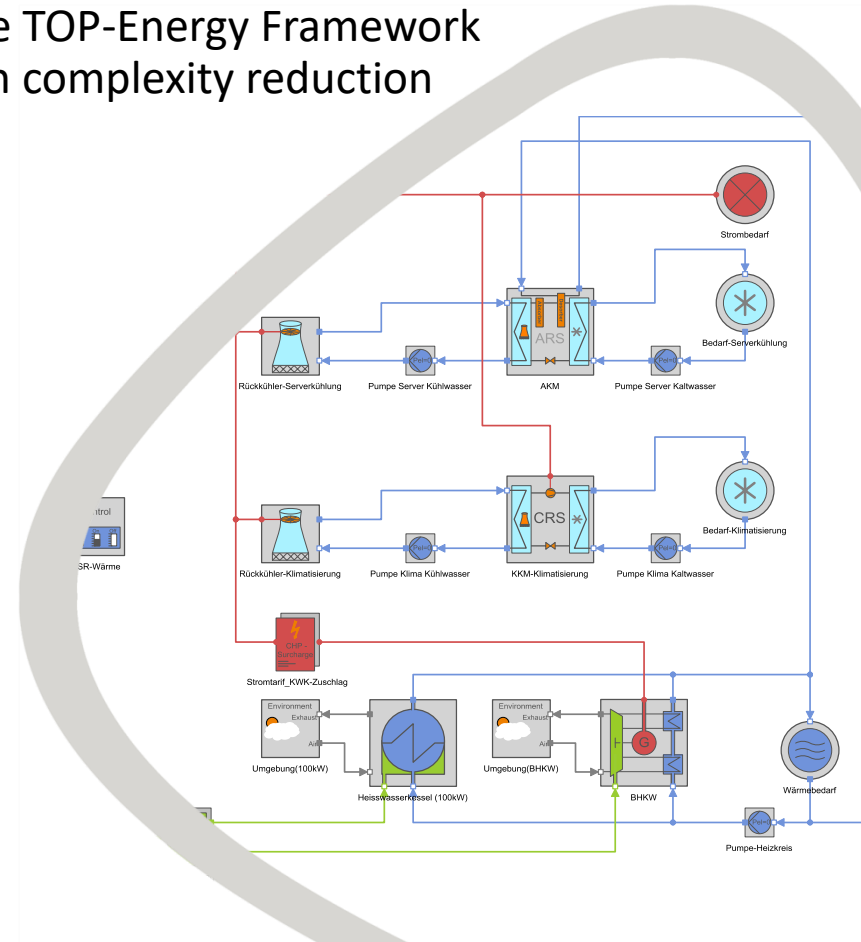


THE TOP-ENERGY FRAMEWORK

The TOP-Energy Framework is a modular software framework that can be used to implement new research results

Example: „Structural Optimization of Distributed Energy Supply Systems” (BMW i)

- **Chair of Technical Thermodynamics:** Development of optimisation methods for structural optimization
- **GFa:** Implementation of the methods using the TOP-Energy Framework
Modelling of technical components, research in complexity reduction



THE TOP-ENERGY FRAMEWORK

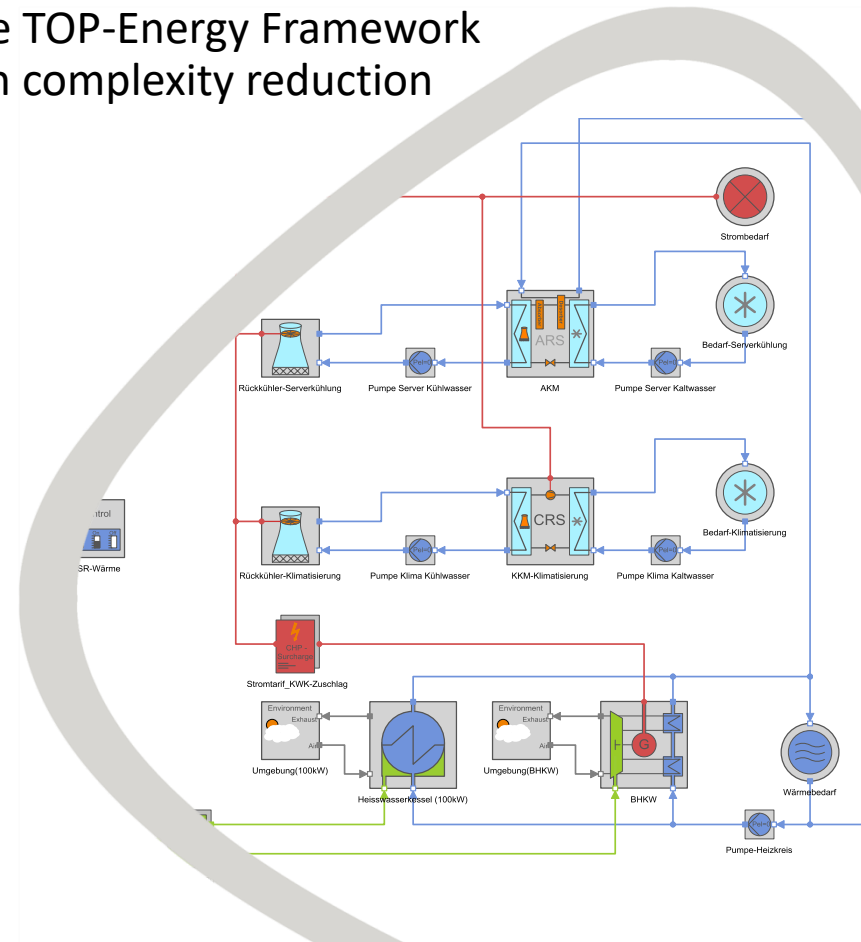
The TOP-Energy Framework is a modular software framework that can be used to implement new research results

Example: „Structural Optimization of Distributed Energy Supply Systems” (BMW i)

- **Chair of Technical Thermodynamics:** Development of optimisation methods for structural optimization
- **GFa:** Implementation of the methods using the TOP-Energy Framework
Modelling of technical components, research in complexity reduction

Features:

- Programming interface to attach new modules
- Handling of all relevant model data
- Full-featured handling of units
- Numerical evaluation of algebraic equations
- Optimization of MILP-Models
- Schematic visualisation of the model
- Im- and Export interfaces available
- Data pre and post processing available
- Windows Look-and-Feel
- Standard graphical user interactions



Thank you for your attention!



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