

RE-BUILDING EUROPE

TOWARDS A FUTURE
SHAPING ECOSYSTEM

SECOND LIFE FOR TALL BUILDINGS

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SECOND LIFE FOR TALL BUILDINGS

workshop on strategies and potentials for
building revitalization and optimization

SECOND LIFE FOR TALL BUILDINGS

REFERENCE PROJECTS



SECOND LIFE FOR TALL BUILDINGS

REFERENCE PROJECTS



SECOND LIFE FOR TALL BUILDINGS

REFERENCE PROJECTS



EU parliament backs law aimed at saving energy by renovating buildings

Reuters



European flags fly outside the European Commission headquarters in Brussels, Belgium March 13, 2023. REUTERS/Yves Herman

BRUSSELS, March 14 (Reuters) - Buildings across Europe could be renovated to cut emissions and save energy after the European Parliament on Tuesday approved a bill that aims to lower households' energy bills and wean EU countries off Russian gas faster.

Buildings account for roughly 40% of the European Union's energy use, and most are heated by fossil fuels. The proposed new rules could require millions of buildings to be upgraded using methods such as insulation or efficient heating systems.

Rate this translation · 🌐

The **#Bestand** remains the **#Sorgenkind!**

When it comes to CO2 savings, most people think of cars or flying. Too little is known about the enormous CO2 savings potential that lies dormant in buildings. In Germany, existing buildings from before 1979 cause more than two-thirds of heat consumption and thus huge CO2 emissions. In addition, construction contributes to almost 50% of Europe's waste generation!

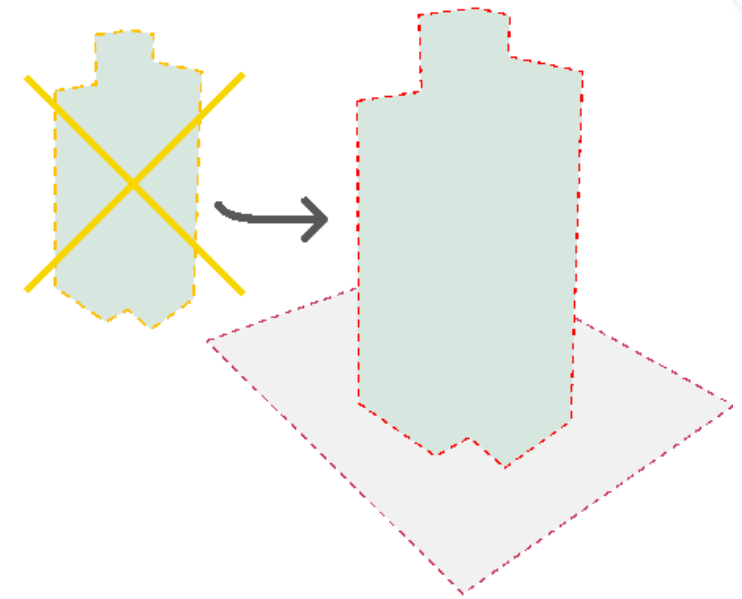
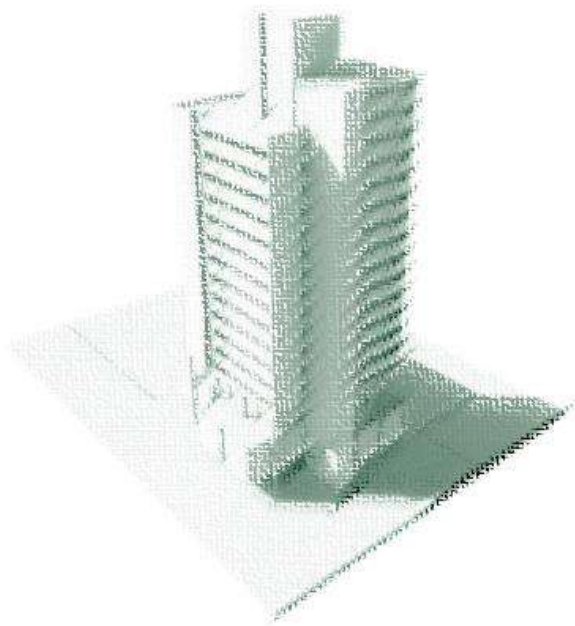
In the new building, a very good level can be achieved with **#Plusenergiehäusern** and many other energetic measures. However, the **#Sorgenkind** is the **#Bestand**. Here it is necessary to change course in renovation and operation!

Possible approaches to this in today's issue of **Frankfurter Allgemeine Zeitung**

<https://lnkd.in/eVKdTSPJ>

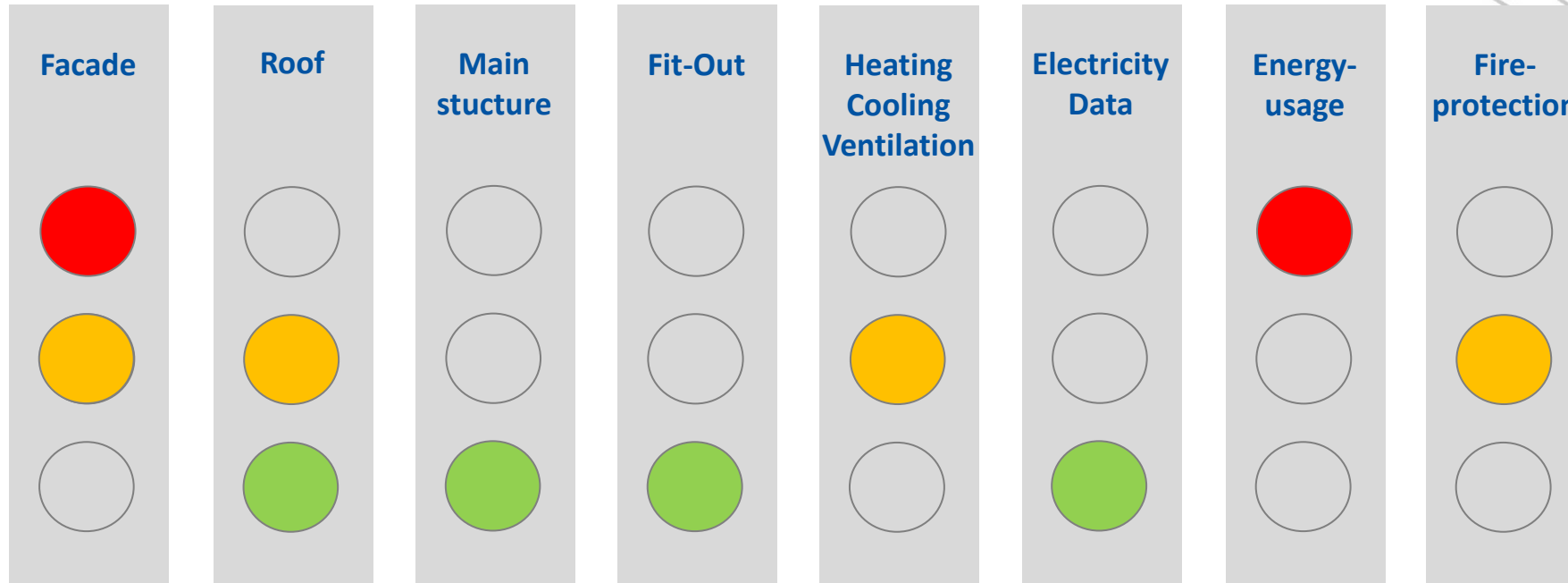


TYPICAL DECISION SCENARIO WITH CONSIDERATION OF THE BUILDING CONDITION
COMPARISON BETWEEN ‚WELL MAINTAINED‘ BUILDING AND ‚RUN-DOWN‘ BUILDING



BUILDING REFURBISHMENT | TYPICAL CONDITIONS

‘WELL MAINTAINED’ BUILDING (OR: INITIAL OWNER PERSPECTIVE OF THE SITUATION)

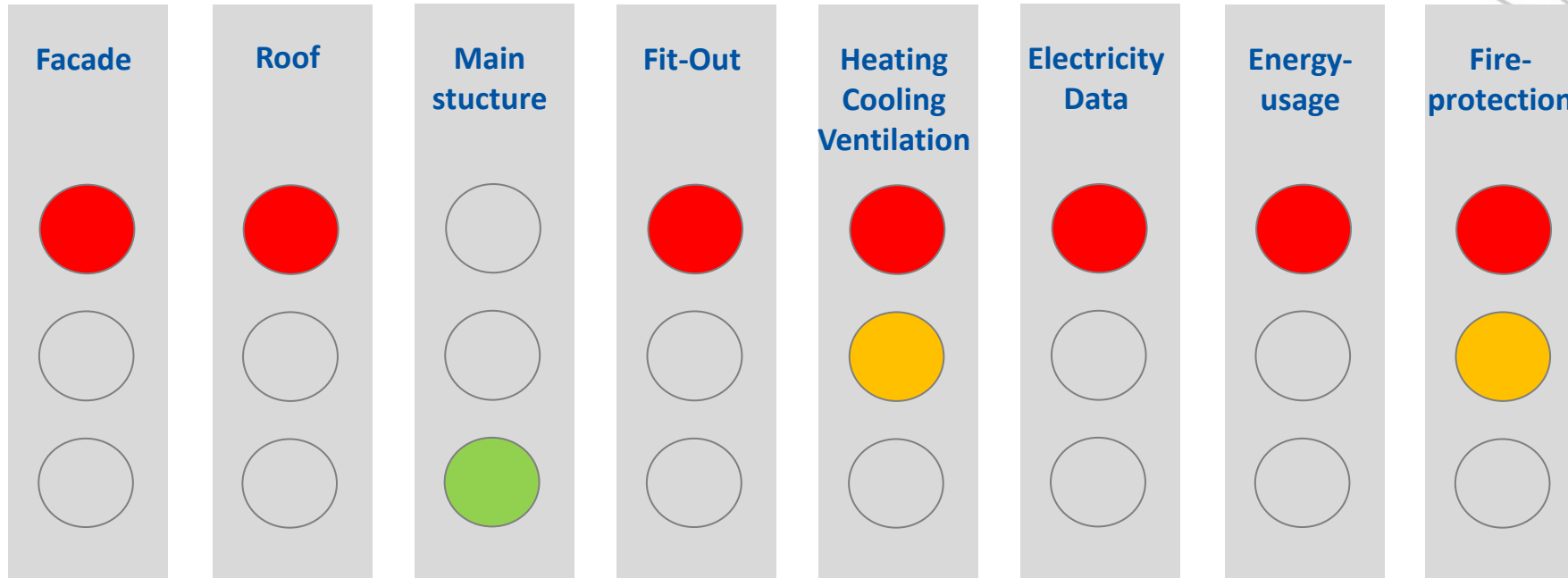


Options for refurbishment:

- | | |
|-------------------------------|--------|
| 1 Facade: | new |
| 2 Ventilation system: | new |
| 3 Room climate concept: | new |
| 4 Main structure and fit-out: | retain |
| 5 ... | |

BUILDING REFURBISHMENT | TYPICAL CONDITIONS

,RUN-DOWN' BUILDING



Options for refurbishment:

- 1 Full refurbishment... or ...
- 2 New construction

RE-BUILDING
EUROPE

TOWARDS A FUTURE
SHAPING ECOSYSTEM

SLIDO QUIZ

FULL REFURBISHMENT OR... NEW CONSTRUCTION ?

QUIZ !



DREES &
SOMMER

CASE STUDY: TOWN-HALL LÖRRACH

FULL REFURBISHMENT OR... NEW CONSTRUCTION ?

Year of construction: 1976

17 floors

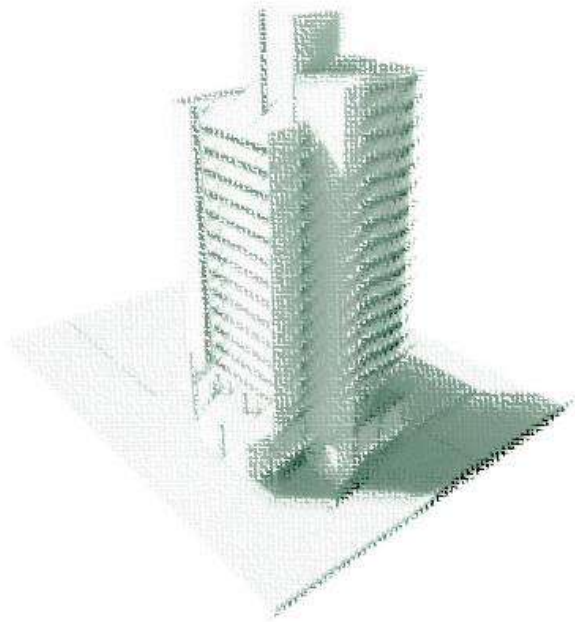


CASE STUDY TOWN HALL LÖRRACH | ECONOMIC AND ECOLOGICAL IMPACT

COMPARISON OF INVESTMENT FOR CONSTRUCTION

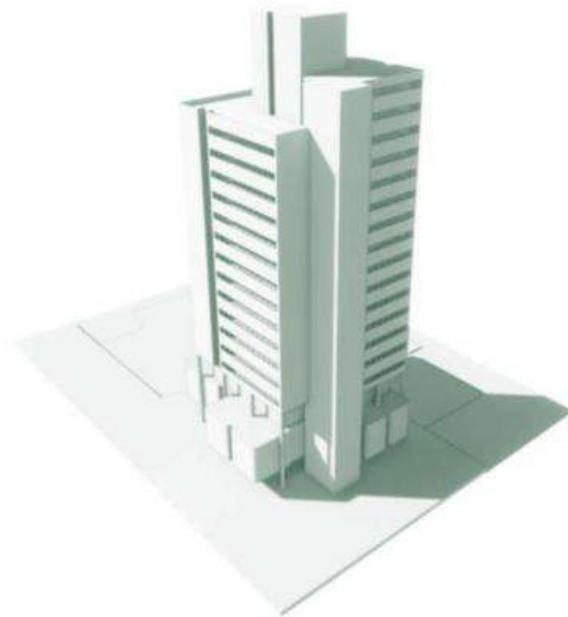
Existing building

Investment:



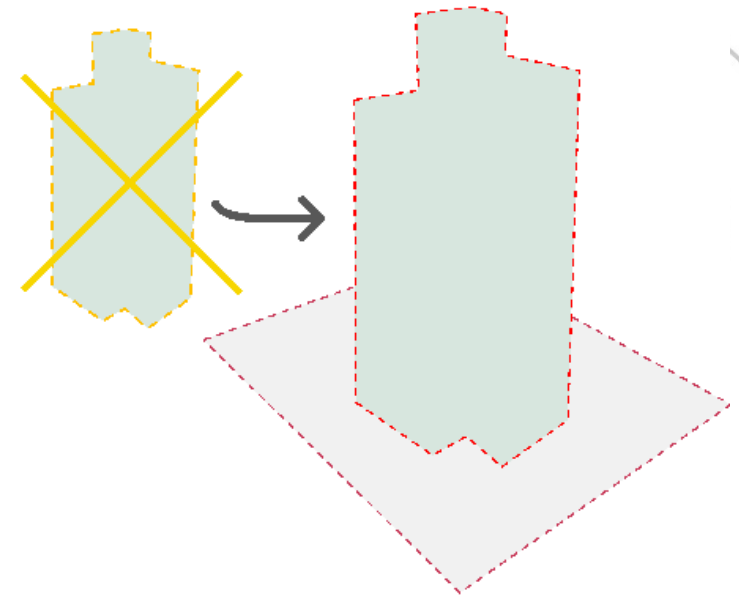
Full refurbishment

45 Mio €



Removal and new construction

69 Mio € (+ 53 %)

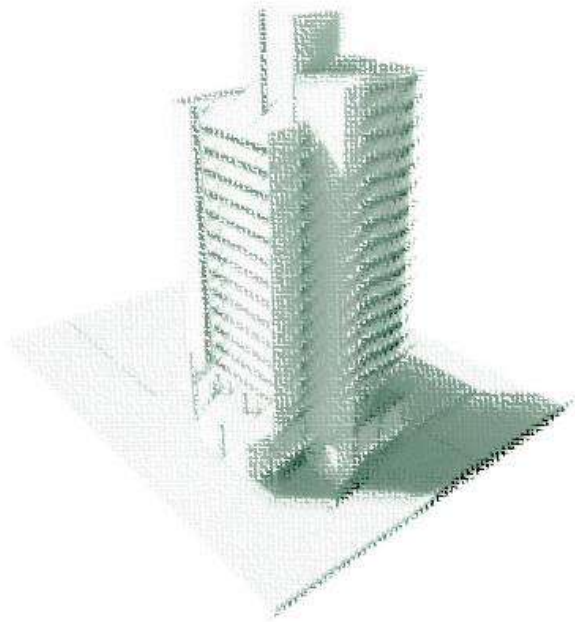


CASE STUDY TOWN HALL LÖRRACH | ECONOMIC AND ECOLOGICAL IMPACT

COMPARISON OF CO₂ EMISSIONS FROM CONSTRUCTION ACTIVITY (NO OPERATION)

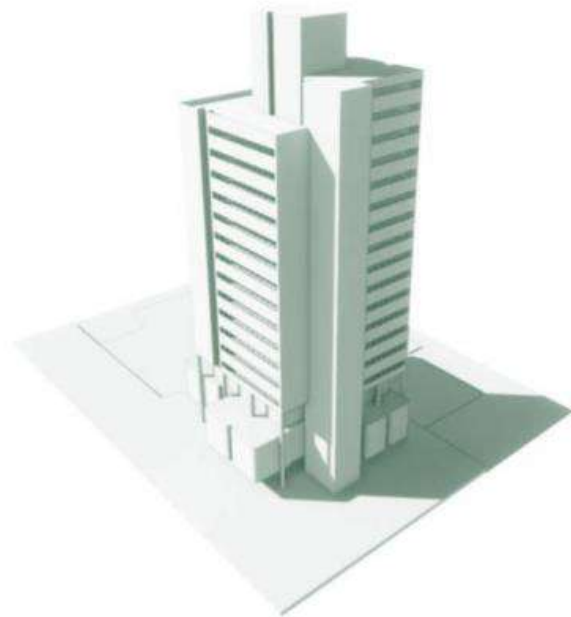
Existing building

CO₂ equivalent:



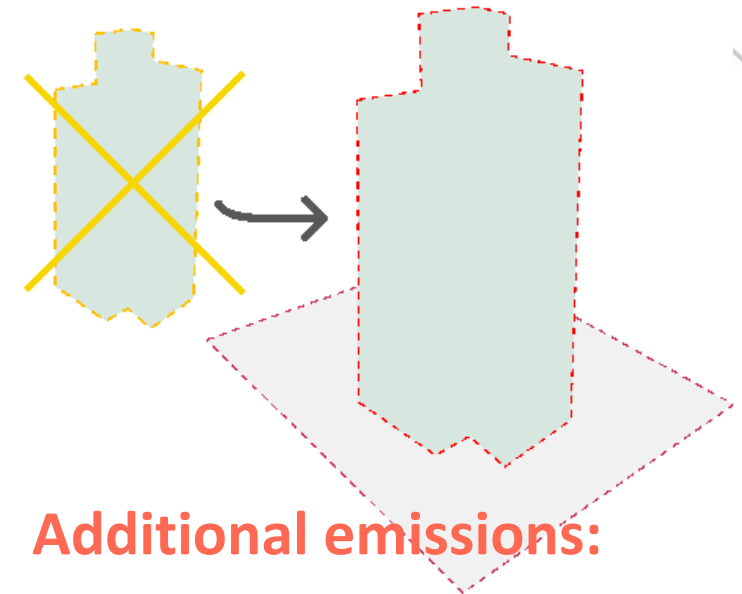
Full refurbishment

166 tCO₂eq



Removal and new construction

1.951 tCO₂eq



Additional emissions:

1.785 tCO₂eq

SECOND LIFE FOR TALL BUILDINGS



OPTIMIZE

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DREISCHEIBENHAUS DÜSSELDORF, GERMANY

Revitalization | MIPIM award winning project

- **Project Owner**
Momeni Projektentwicklung GmbH
Hamburg
- **Architect**
HPP Hentrich-Petschnigg & Partner
Düsseldorf
- **Project Duration**
January 2011 until December 2015
- **Drees & Sommer Services**
Façade Engineering
Building Physics
Energy Design | Simulations



OPTIMIZATION OF AN BUILDING ICON

SITUATION BEFORE REVITALIZATION: LOW RENTABILITY DUE TO REDUCED COMFORT

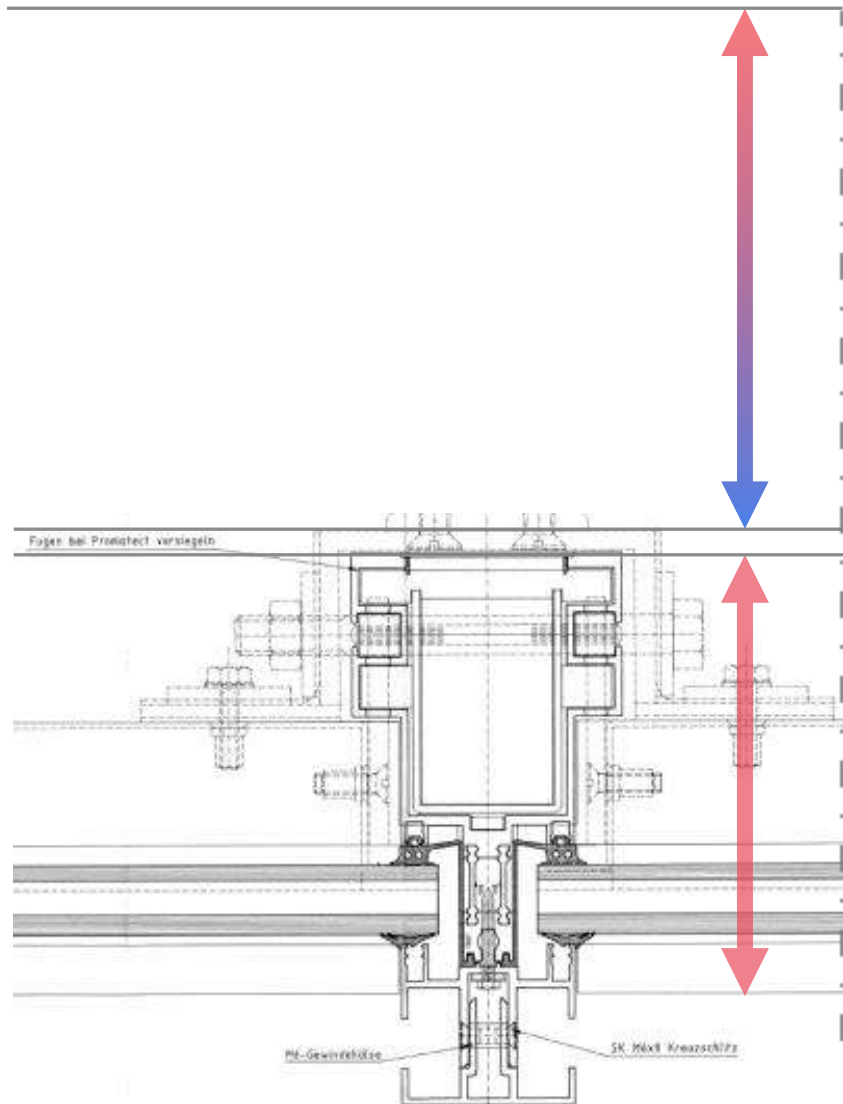
- cold in winter
- hot in summer
- no natural ventilation
- low utilization: empty floors for years
- previous refurbishment works did not consider the need of the user

→ Avoid previous mistakes



OPTIMIZATION OF AN BUILDING ICON

OPTIMIZATION OF TRANSPARENT FACADE PART – NEW THERMAL LAYER AS ‚ADD-ON‘ SOLUTION

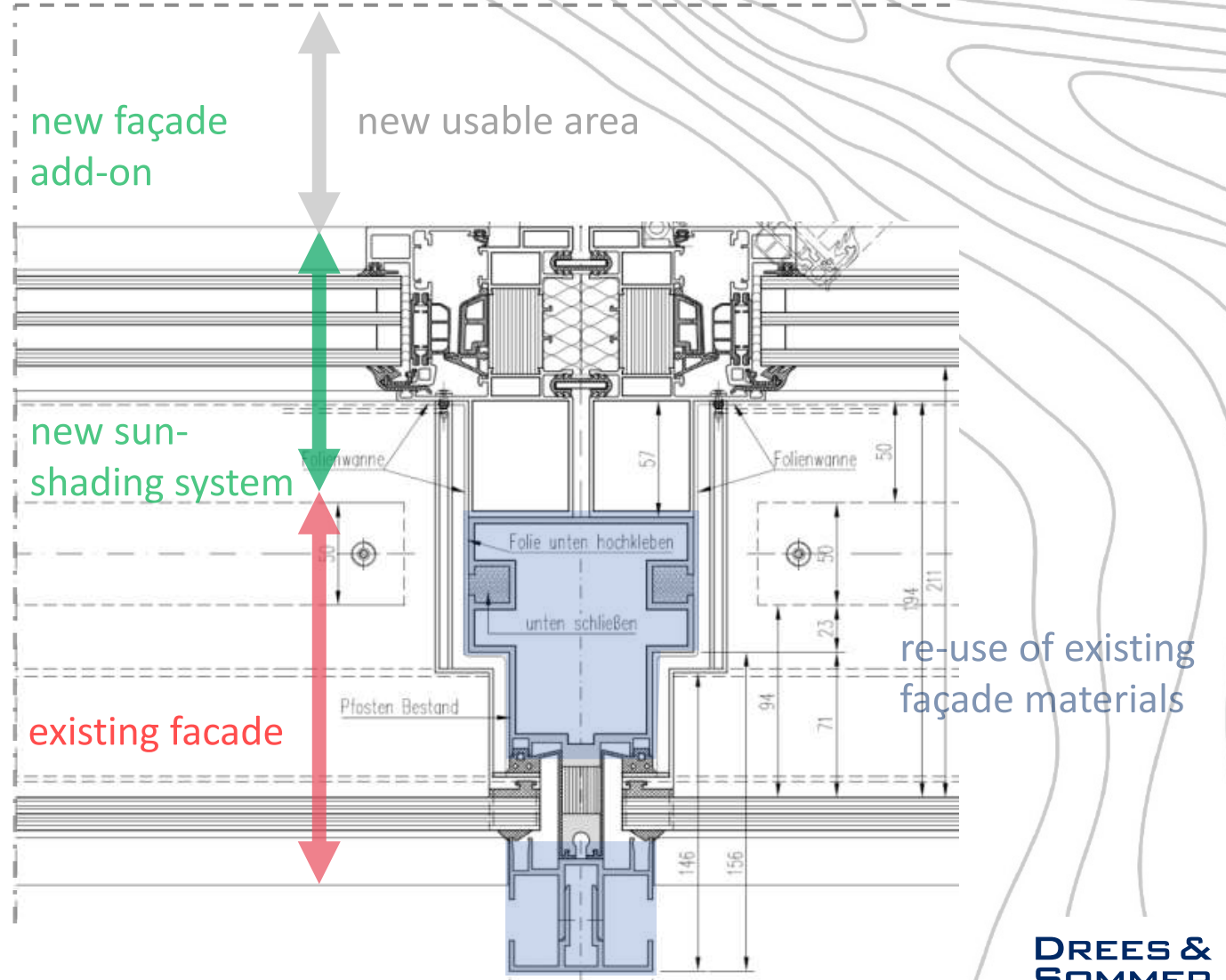
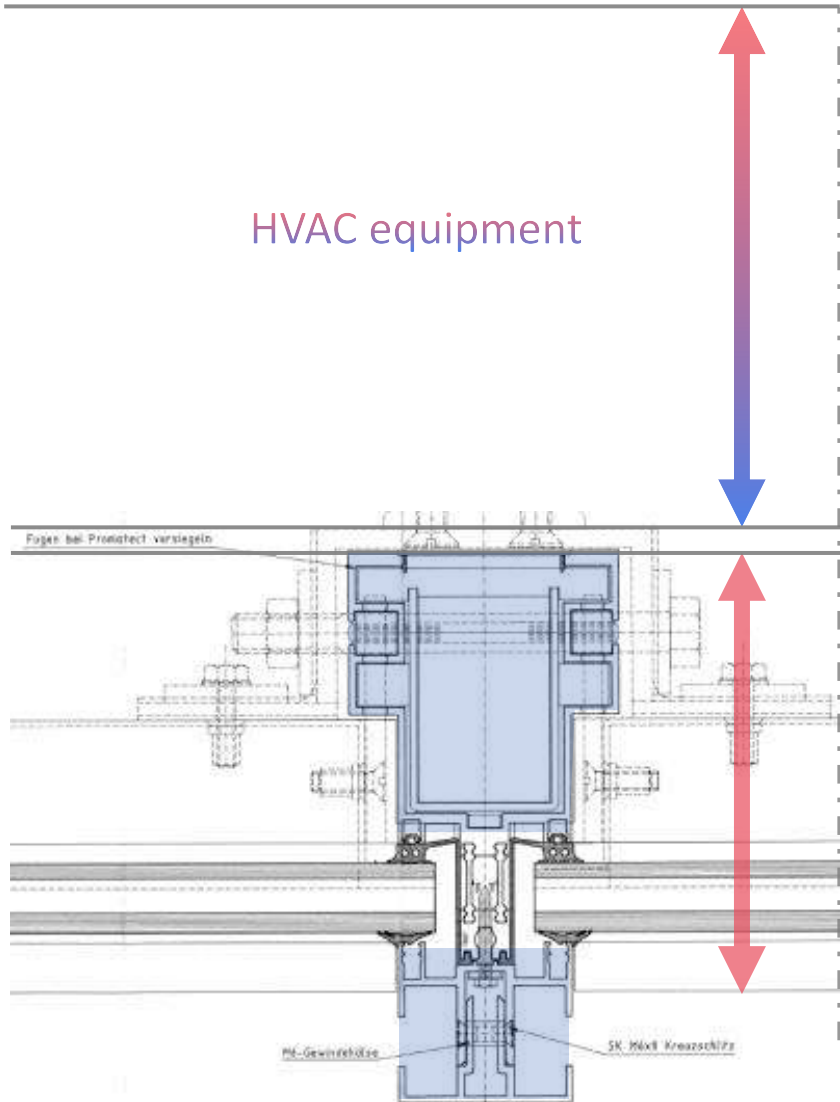


HVAC equipment

existing facade

OPTIMIZATION OF AN BUILDING ICON

OPTIMIZATION OF TRANSPARENT FACADE PART – NEW THERMAL LAYER AS ,ADD-ON‘ SOLUTION



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TOWARDS A FUTURE
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BENEFITS AFTER REFURBISHMENT

750 m² additional office space for lease from
reduced façade build up

Optimized energy efficiency

- + Effective exterior sun shading system
- + Reduced cooling loads from effective solar protection system
- + Optimized room climate systems

Natural ventilation possible after façade refurbishment

- + Building is **now fully rented out**
- + Improved thermal and acoustical comfort

Reuse of existing façade materials

- + Reduction of construction waste

SLIDO OPINIONS 01

PROBLEMS AND PAINS WITH OLDER BUILDING STOCK ...



SECOND LIFE FOR TALL BUILDINGS

2

INTEGRATE

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TOWARDS A FUTURE
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DEUTSCHE BANK TOWERS FRANKFURT, GERMANY

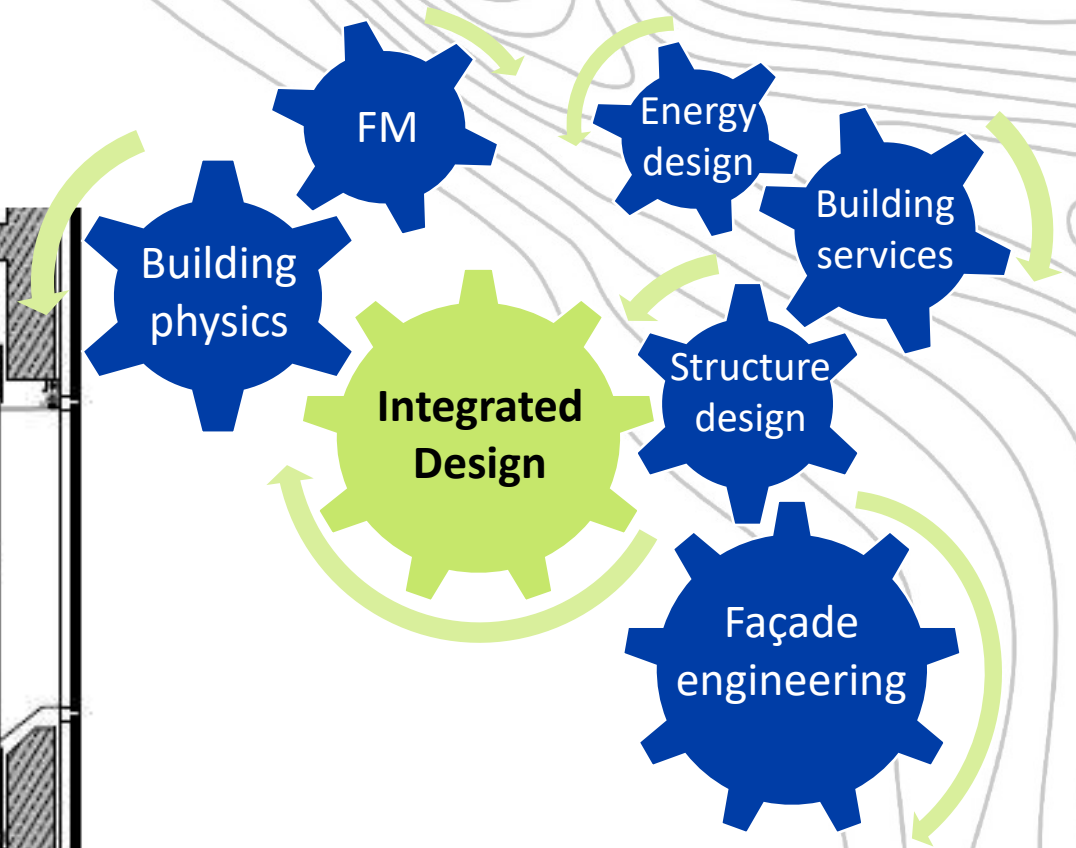
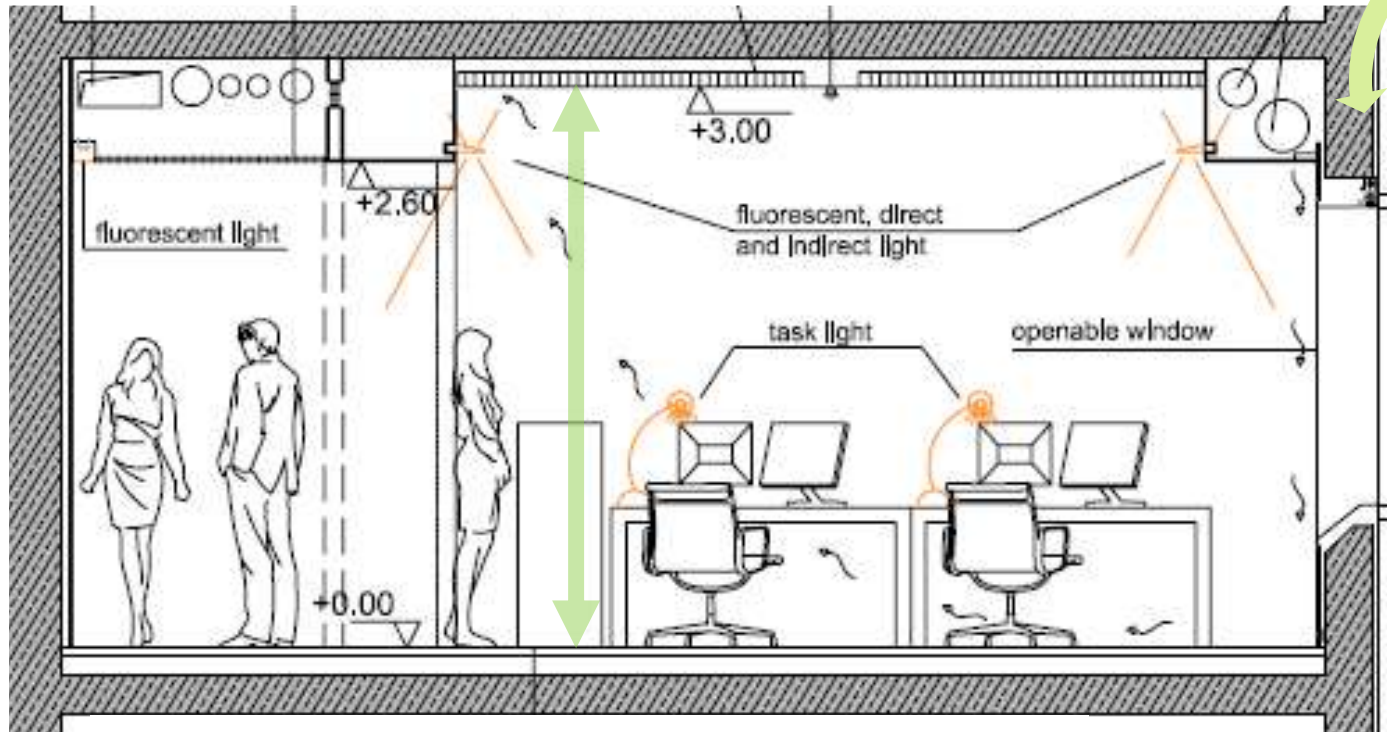
Integrated Engineering Solutions | HQ office towers

- **Project Owner**
Deutsche Bank AG Corporate Real Estate (CRES)
Frankfurt
- **Project Management**
Drees & Sommer GmbH Frankfurt
- **Architect**
gmp Architekten Hamburg
Mario Bellini Milan
- **Project Duration**
December 2006 until November 2011
- **Drees & Sommer Services**
Integrated Engineering Design
[Façade Engineering](#)
[Building Services Engineering](#), Technical Controlling
Building Ecology, Construction Biology
Green Building-Management
DGNB-/LEED certification
Facility Management



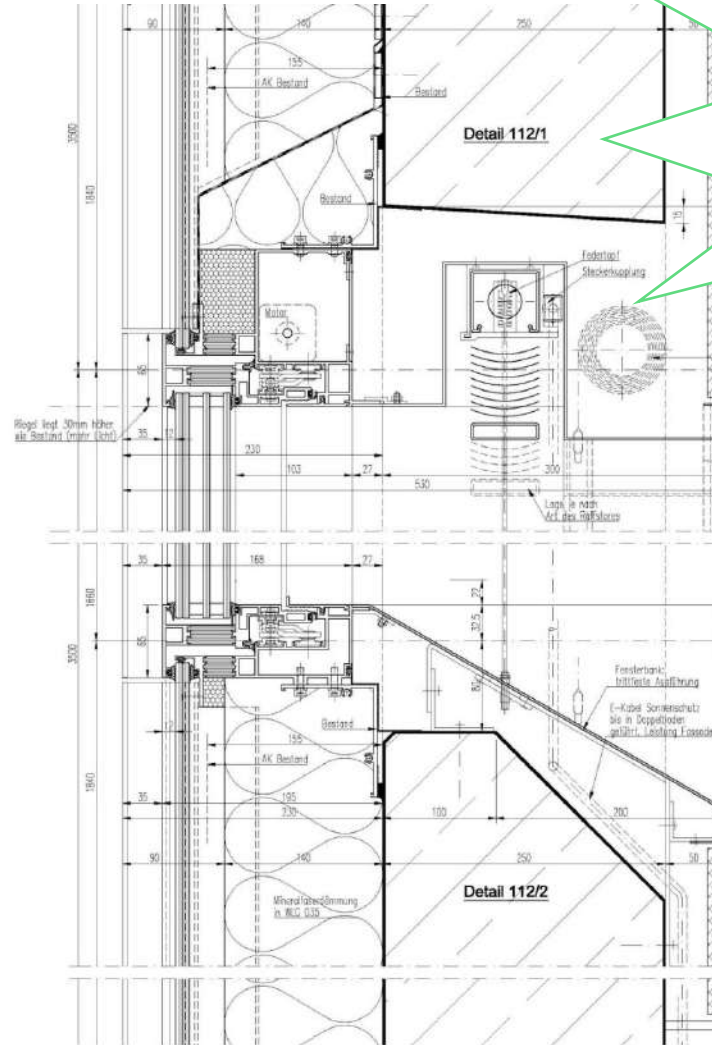
INTEGRATION ON MULTIPLE LEVELS | DESIGN APPROACH

INCREASED COMFORT | NEW CLEAR CEILING HEIGHT



INTEGRATION ON MULTIPLE LEVELS | DESIGN APPROACH

INCREASED COMFORT | NATURAL VENTILATION NOW POSSIBLE



NEWLY INTEGRATED
OPERABLE WINDOWS



BENEFITS AFTER REFURBISHMENT

20% Increase of utilization: 600 additional work spaces

+ 2 entire floors can be cleared from HVAC equipment

Natural ventilation possible after façade refurbishment

+ Optimized comfort with the room climate concept

+ First project worldwide with retrofitted integrated active concrete slab



Increased efficiency on multiple levels during operation of the refurbished towers:

BENEFITS AFTER REFURBISHMENT



Heating Reduction: 67 %

67% savings per year = heating energy for approx. 750 households.



Electrical Reduction : 55 %

Savings of 55% power = annual consumption of approx. 1,900 households.



Water Reduction: 74 %

74% saved water per year = filling of 22 Olympic-sized pools.



CO2 Reduction: 89 %

Reduction of 89% per year = 6,000 cars driving 12,000 km.



Utilisation ratio add: 20 %

After the renovation, up to 600 additional employees will benefit from the new upgraded work environment.



CHALLENGES AND OBSTACLES OF REVITALIZATION ...



SECOND LIFE FOR TALL BUILDINGS

3

ACTIVATE



INNOVATE

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TOWARDS A FUTURE
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Super slim
facade

DREES & SOMMER OFFICE BUILDING

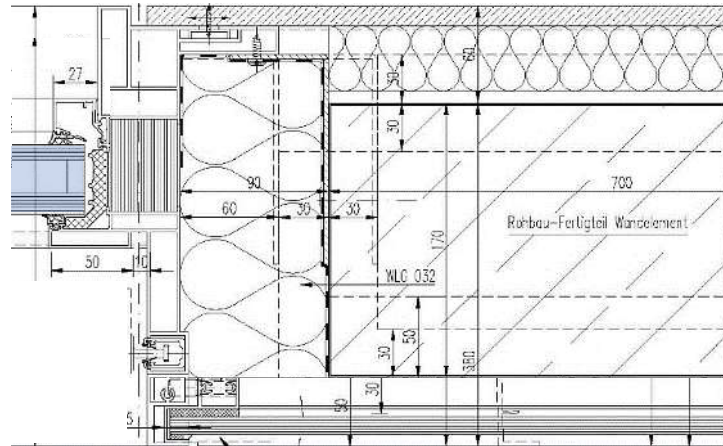
Façade innovation

„REDUCE TO THE MAX“

- **Project Owner**
Drees & Sommer
- **Architect**
SCD architects Stuttgart
- **Project Duration**
2017 until 2022
- Lighthouse project with innovation building technologies

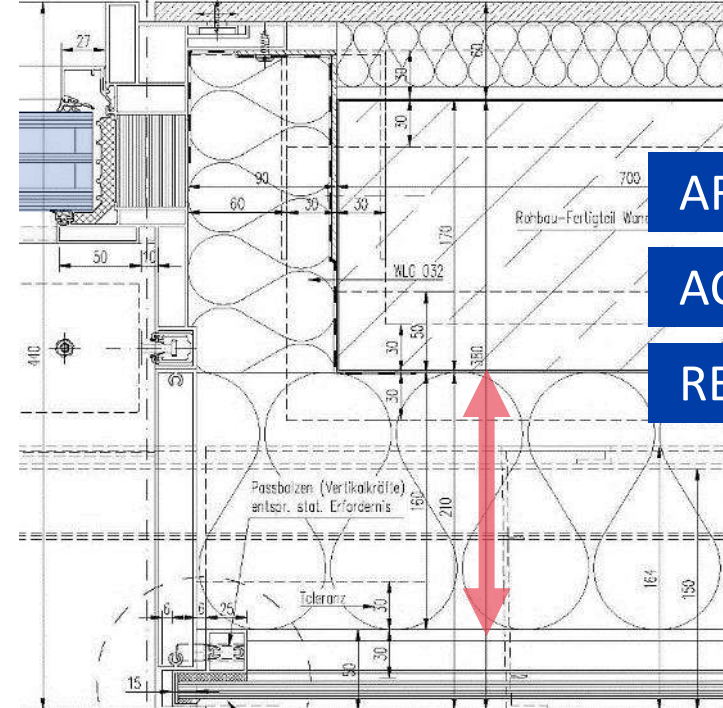


AFTER REFURBISHMENT WITH CONVENTIONAL MATERIALS ... ,GOOD BYE ARCHITECTURE'...



EXISTING BUILDING

EXTERIOR WALL



thermal insulation

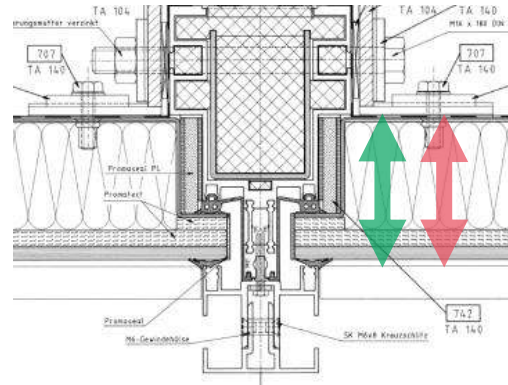
AFTER RENOVATION
ACC. TO MODERN
REQUIREMENTS



EXISTING CURTAIN WALL

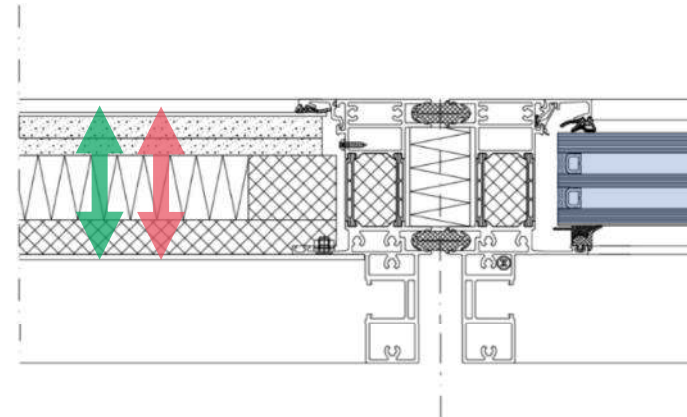
FACADE

1.8 W/m²K



0.4 W/m²K

U_{cw} is possible !



SLIM

HIGH-PERFORMANCE

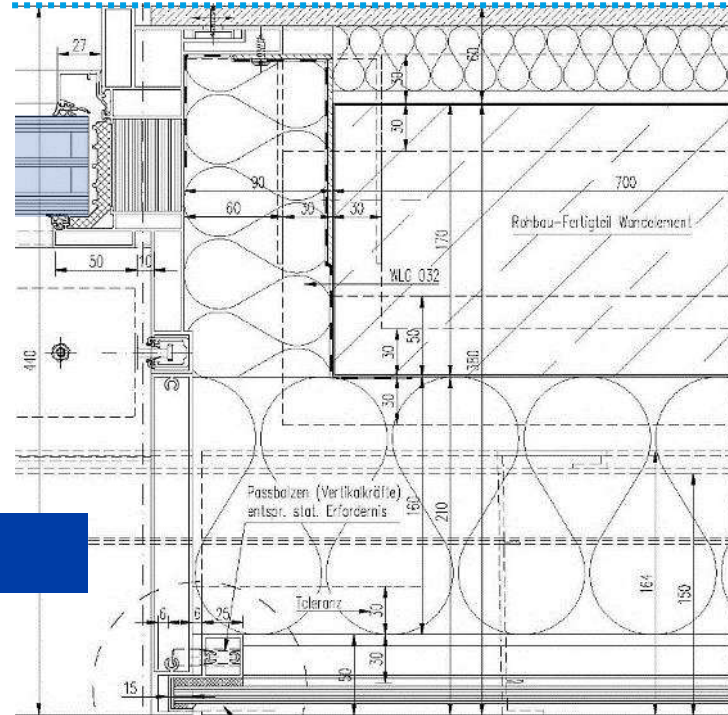
FACADE

soundproofing

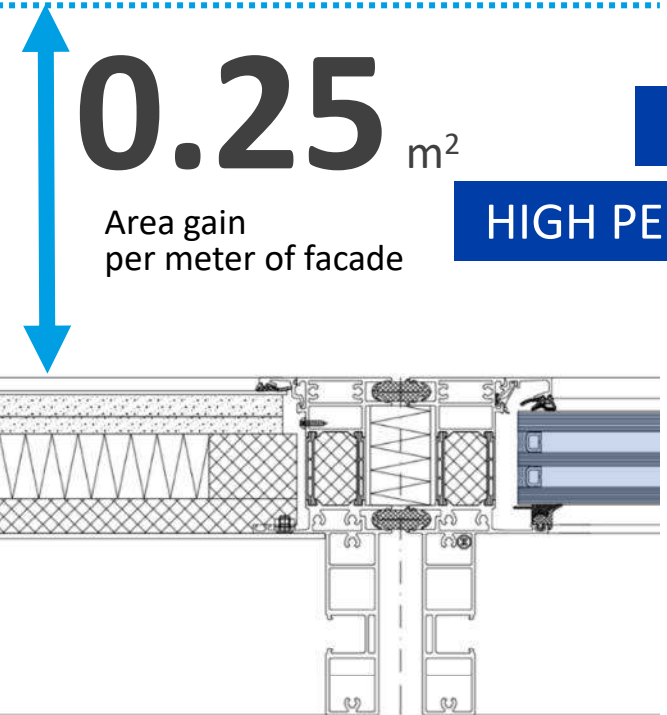
thermal protection

INNOVATIVE FACADE BUILD-UP

ONLY 90 MM THERMAL LAYER | 200 MM FACADE BUILD-UP



CONVENTIONAL
OUTER WALL



0.25 m²
Area gain
per meter of facade

SLIM
HIGH PERFORMANCE
FACADE



NEXT PRACTICE HIGHRISE FACADES

For new construction or **renovation projects**

Super-slim façade: **0,25 m² area gain per m façade** for lease or sale

Super insulating façade:
+ 0,4 W/m²K possible with 90 mm façade panel
+ 48 dB noise absorption

Façade as a **power plant**: first fully unitized PV-façade

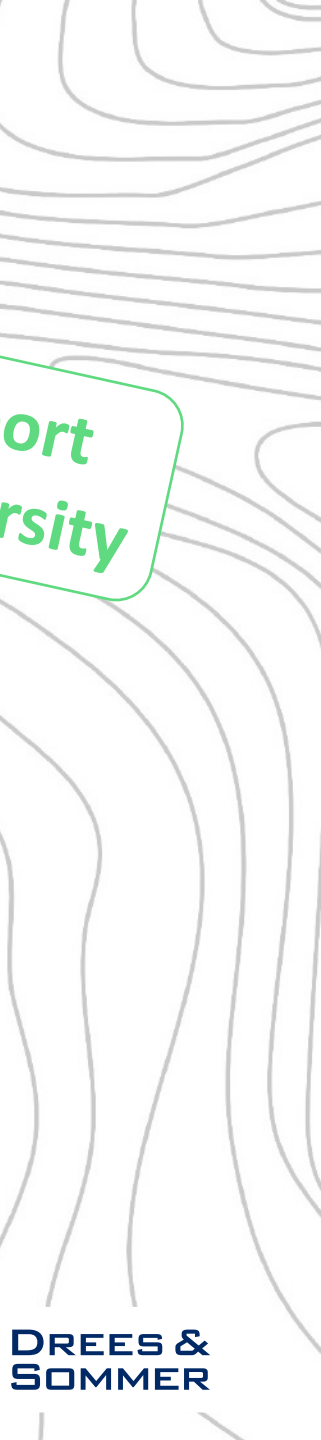
Circular engineered building envelope: all materials can be fully re-used

I am a
powerplant...



I support
bio-diversity

ACTIVATE !



SECOND LIFE FOR TALL BUILDINGS

3

INNOVATE

→ RE-PURPOSE

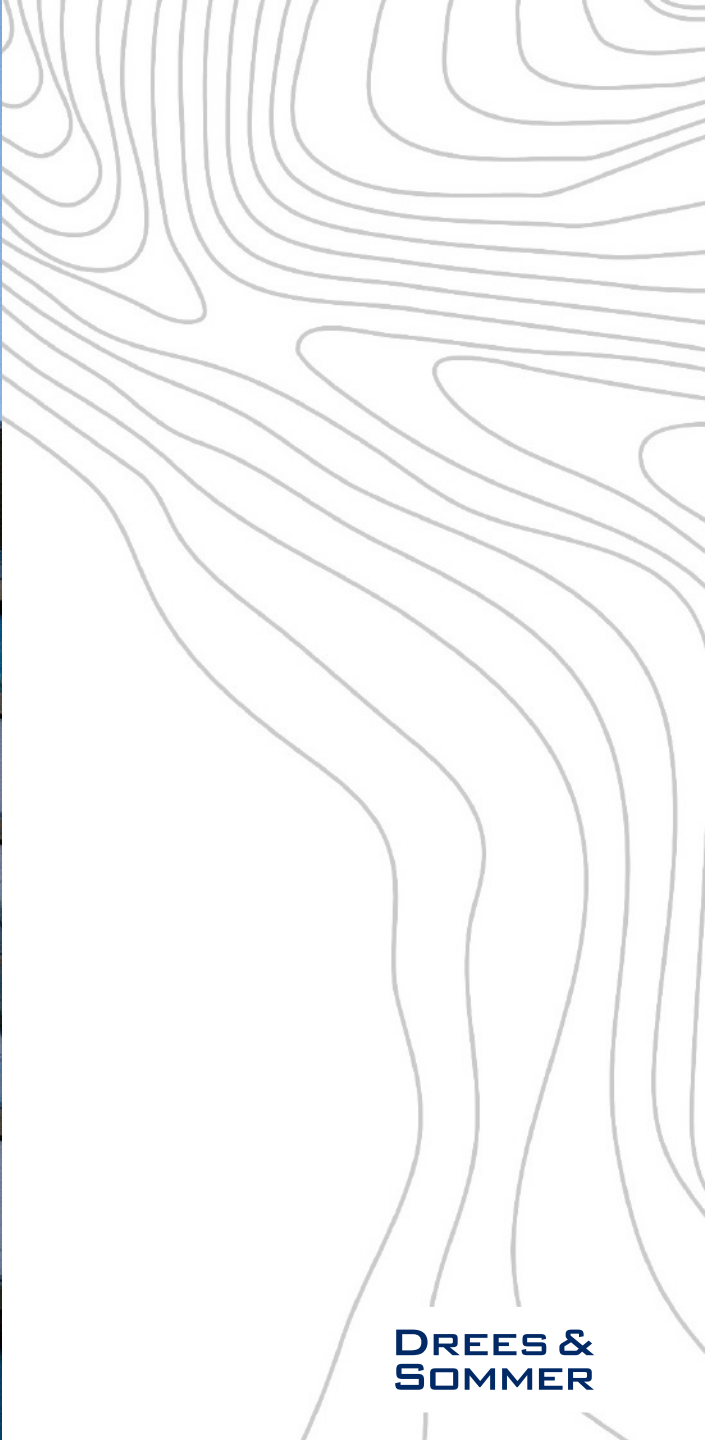


THE SEVEN INDUSTRIAL REFURBISHMENT AND RE-PURPOSE | MUNICH

High-End residential building

- **Project Owner**
Alpha Invest Project GmbH München
- **Architect**
Leon Wohlhage Architects, Berlin
- **Drees & Sommer Services**
Integrated Engineering Design
Façade Engineering – all design phases

I was a
powerplant ...

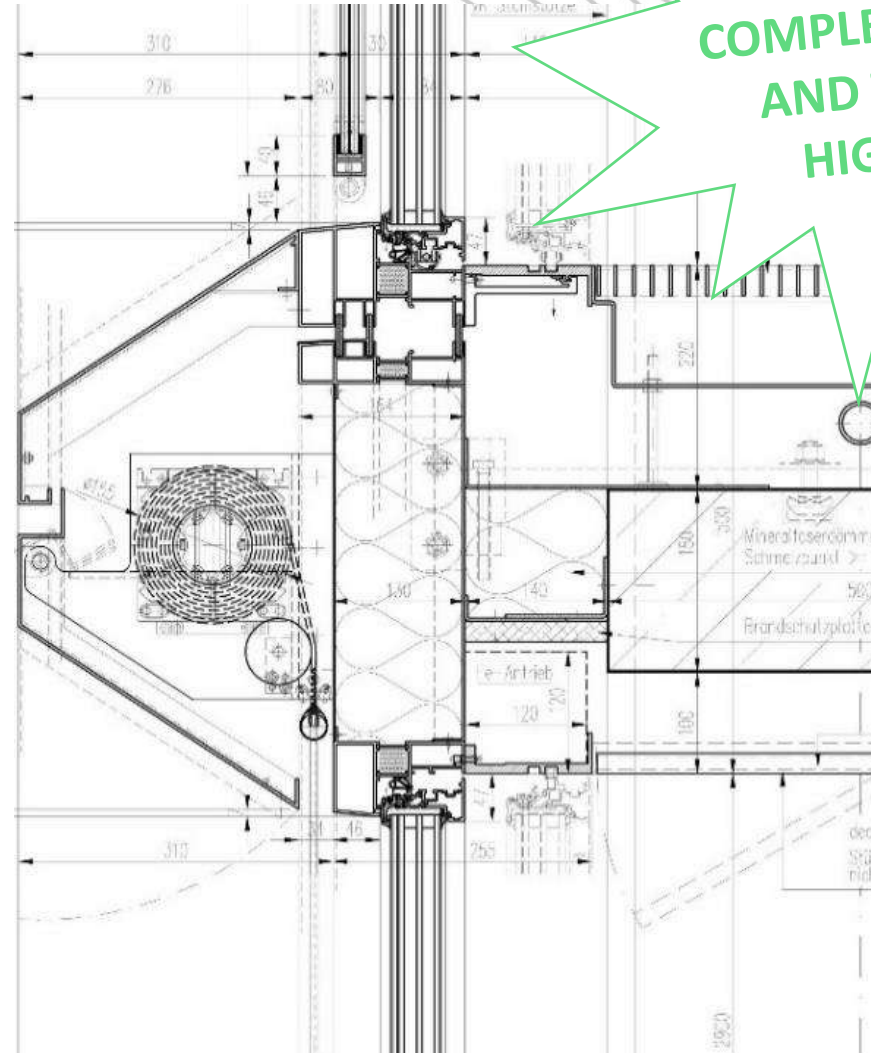




COMPLETELY NEW
AND TOTALLY
HIGH END

INDUSTRIAL BUILDING RE-PURPOSE

ADDED VALUE FOR THE NEW BUILDING FUNCTION: TRANSPARENT SUN SHADING



COMPLETELY NEW
AND TOTALLY
HIGH END

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INNOVATE

→ RE-THINK

RE-BUILDING EUROPE

TOWARDS A FUTURE
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PRINCIPLES OF DESIGN FOR DISASSEMBLY



2.000 years



Quelle: <https://www.handelsblatt.com/auto/test-technik/modularer-querbaukasten-vws-erfolgsrezept-fuer-die-kompaktwagen-zukunft/7040736.html?ticket=ST-41095510-5Gwg0WPq4zytlgBpa3VX-ap3>

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TOWARDS A FUTURE
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DESIGN FOR DISASSEMBLY ...

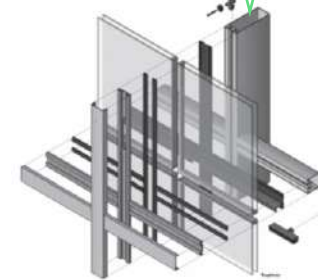
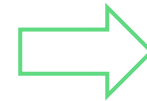
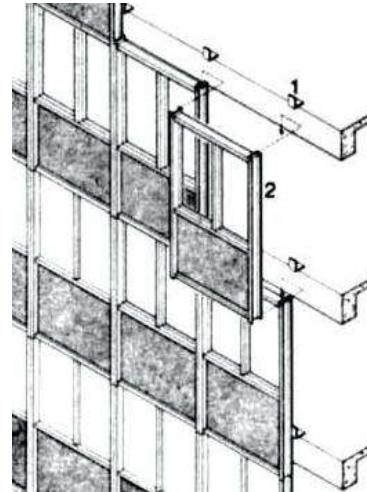
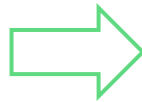


SEPERABILTY ?
CLEAN MATERIAL
CYCLES ?

RE-BUILDING EUROPE

TOWARDS A FUTURE SHAPING ECOSYSTEM

MODULARITY AS KEY TO MATERIAL CYCLES



PLANNED END OF SERVICE LIFE



Building Material Scout

DREES & SOMMER

SLIDO FEEDBACK

ARE YOU INTERESTED TO KNOW MORE ABOUT ... ?





RE-BUILDING
EUROPE

TOWARDS A FUTURE
SHAPING ECOSYSTEM

DREES &
SOMMER