

Retrofit in Refrigeration

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AMCA European Fan Symposium 2024



Andreas Walter

**ZIEHL-ABEGG SE |
Global President
Product Unit
Aftersales & Service**



Biography

Since 1987 at ZIEHL-ABEGG SE

1987 – 1996: Vocational education & dual studies in Electrical Engineering | Ventilation Product Development

Until 2002: Project Engineer in Sales

Until 2023: Area Sales Manager & Key Account Manager

2020-2023: Responsible for international business development of Retrofit

Since 2024: Global President Product Unit Aftersales & Service



Retrofit in Refrigeration

01

Potential of Retrofit in Refrigeration Systems

02

Conditioned Air: Cost Analysis of Old & New Systems

03

Key Points to be considered in Retrofit Projects

04

Challenges within a Retrofit Project

05

Call to action





01 Potential of Retrofit in Refrigeration Systems

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Potential of Refrigeration Systems in Europe

- ~ 40 % of the total energy consumption in Europe is dedicated to the building sector
- More than 1/3rd are non-residential buildings
 - A large proportion is used for HVAC systems
 - A large proportion is just used from fans
- Improvements are crucial to achieve the goal of the Green Deal by 2050
- Renovating the buildings would reduce the **overall** energy consumption in Europe by 5-6%
- Only between 0.4 - 1.2% of the European buildings necessary to be renovated are renovated
- With this speed, we will miss the given targets 2050



Potential of Refrigeration Systems in Germany

- The German GEG (building energy) law states
 - building operators are obligated to inspect their HVAC systems with ≥ 12 kW of cooling capacity every ten years
- Estimation in Germany
 - 320.000 – 420.000 HVAC systems with ≥ 12 kW of cooling power which need to be inspected
 - 480.000 – 630.000 AHU`s with < 12 kW of cooling power which should also be inspected

[GEG §74; Schiller 2013]



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All building types are relevant!

- Warehouses
- Universities/School buildings
- Airports
- Offices
- Hospitals
- Datacenter
- Production buildings
- Shopping Centers
- Supermarkets
- Hotels
- ...



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***The entire society is affected
and called to be active !***



Potential of Improvement

- HVAC : More than 50% of all energy inspections recommend to replace at least the inefficient fans
- HVAC : In average ~ 50 % energy saving is technically achievable, if efficient components would be combined with a demand-based control
- Potential savings in German's HVAC systems, considering all possible optimization measures
 - 12.5 TWh of electricity p.a.
 - 12.9 million tons of CO₂ p.a.

(Power consumption of Hamburg is 10 TWh p.a.)

(1 beech tree can save around 12,5 kg of CO₂ p.a.)



[FGK]

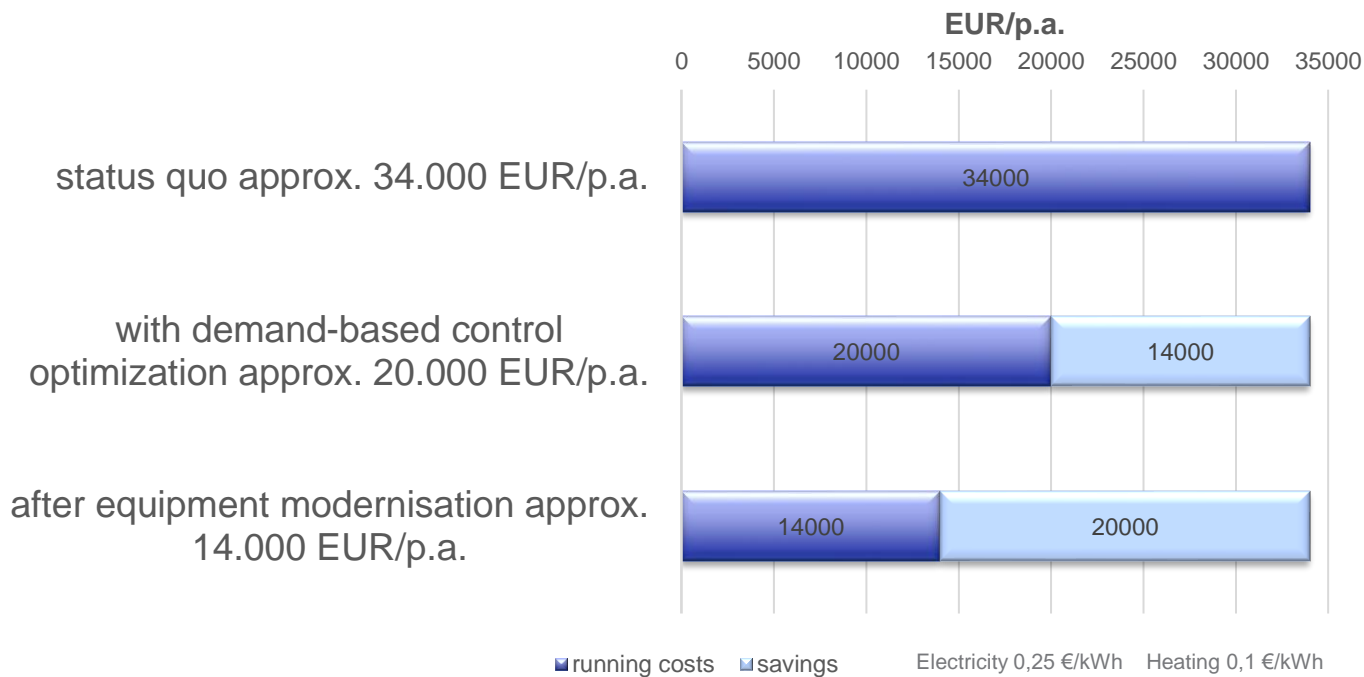


02

Conditioned Air: Cost Analysis of Old & New Systems

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Yearly costs of an AHU with 20.000 m³/h (only heating)



[IBDM Detlef Malinowsky]



03

Key Points to be Considered in Retrofit Projects

Key Points to be considered in Retrofit Projects

- Does the application still work?
- How old is the equipment?
 - System information available?
- Does the current operating point cover the actual demand?
- How is the load profile of the unit ?
- Is there a demand-driven control system in place or not ?
 - Sensors are available / do they work?
- What is the focus of the customer?
 - Efficiency
 - Acoustics
 - Redundancy
- ...





04 Challenges within a Retrofit Project

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Challenges: Assessment of the Project

- How are the circumstances of the application?
 - Accessibility
 - If / when is the downtime accepted
- Realtime measurements
 - Pressure
 - Airflow
 - power consumption
 - available space
- What is part of the project
 - Fan exchange
 - Filter system/Desinfection devices
 - Heat recovery
 - Potential Add-Ons: Heating/Cooling
 - ...



Challenges: Planning

- Selection of the right fans and equipment in order to fulfill all customer requirements
 - (efficiency – acoustics - redundancy)
- Potential access into an existing or a modernized BMS
- Planning of
 - the logistics in the building
 - access for the team
 - dismantling and transport of the old equipment

- Time schedule:
 - Availability of the new equipment
 - Availability of the different workforces
 - Coordination of downtime



TELEVISION SWITZERLAND



REDUCTION OF
ENERGY
CONSUMPTION
62 %



ANNUAL SAVINGS
39.260 €



ROI:
3,8 years



ANNUAL CO2 REDUCTION
78 t



PROJECT DATA

GENERAL DATA



17.400 m³/h



30 Pa



6570 h/p.a.

OLD SITUATION



60 x FN100-ADS.7M.V5P1



332.271 kWh/p.a.

NEW SITUATION

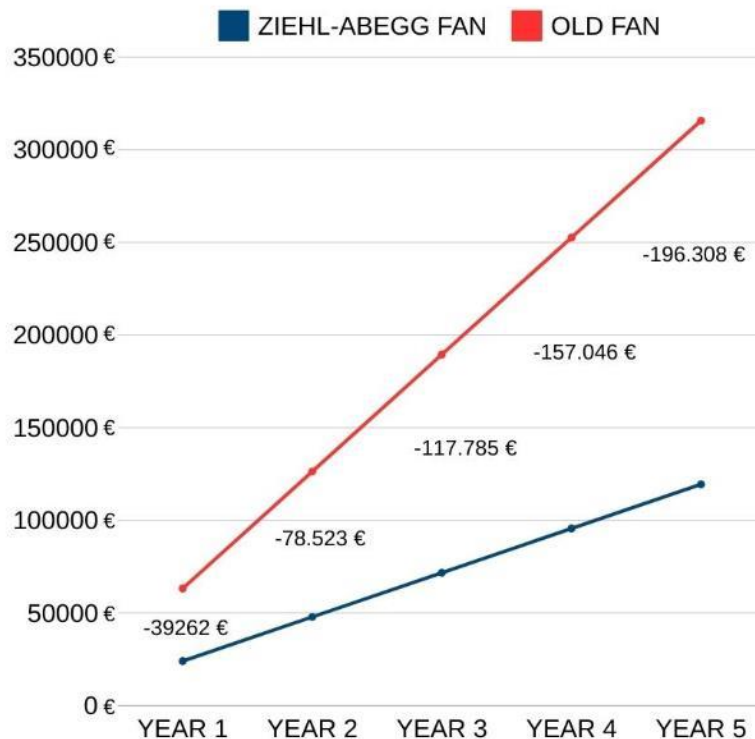


60 x ZN100-ZIL.GG.V5P1



125.631 kWh/p.a.

ENERGY COST OVER TIME



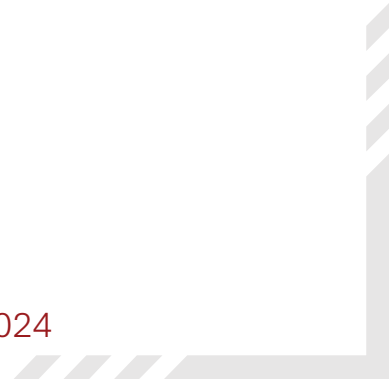
Side effect of a successful retrofit project

- Invest the saved money in further retrofit projects
- Increase the value of the building
- Increase the appeal for the tenants
- Get the building ready for future requirements regarding efficiency and automation
- Enable remote monitoring
 - Service on demand / predictive maintenance / less operating costs
- Redundancy + operational security
- Support the health & productivity of the tenants / workers
- Improve the public image of the operator / Carbon footprint
- Positive impact into the sustainability report
-



05 Call to action

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Call to action

- Modernization is a must for the entire society!
- Investments in modernization pay themselves off in a short time
- The benefits outweigh the risk

Doing nothing means going backwards!

Call to action

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Doing nothing means going backwards!

**How does your
equipment look like ?**



Thank you!

Do you have any questions?

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