

**Fachverband
Gebäude-Klima e.V.**

**Press Conference
Dec 14th, 2020**

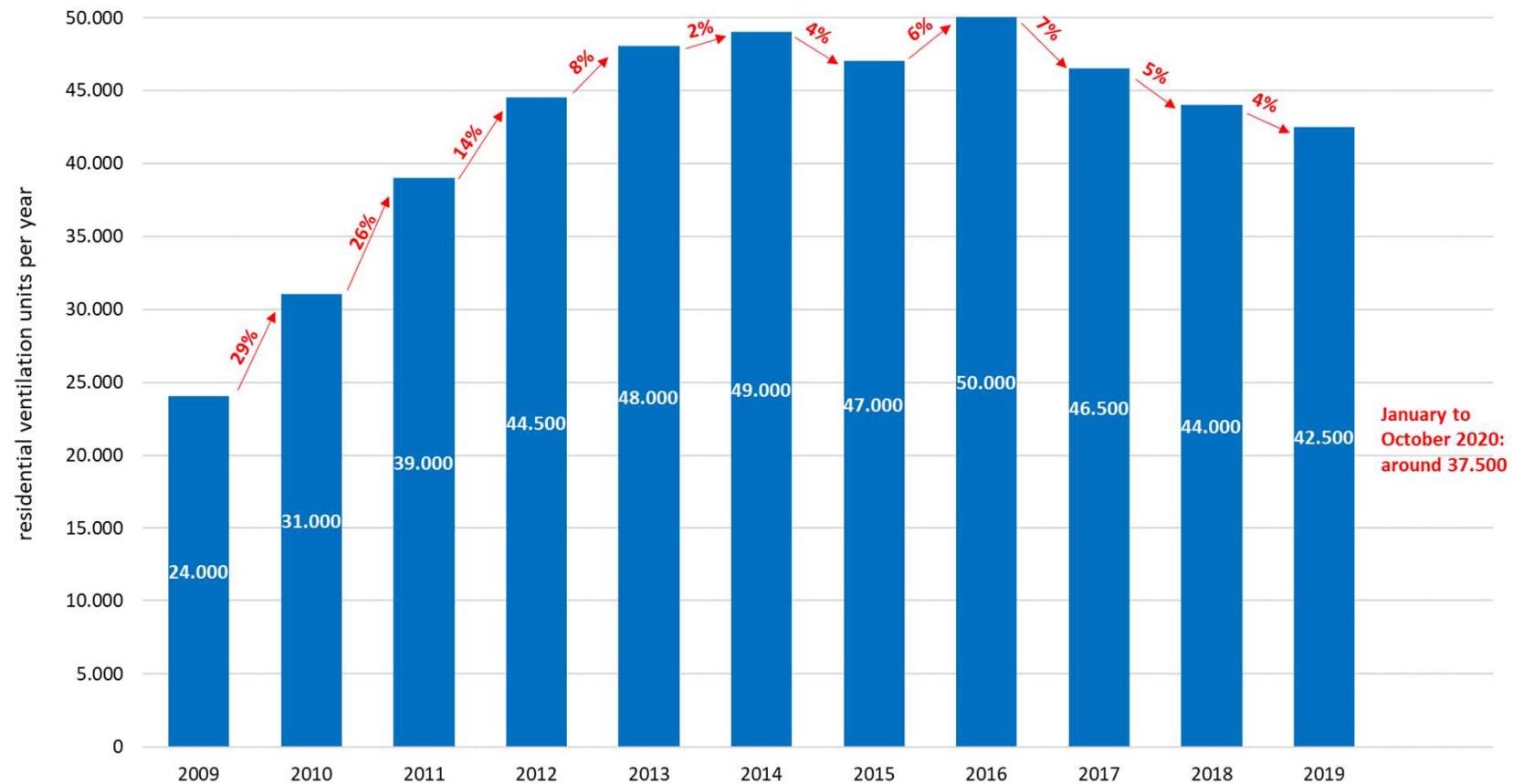
ISH 2021 digit on March 22nd – 26th

Günther Mertz

Current Topics in the Air Conditioning and Ventilation Industry

- Hygienic requirements of ventilation under the aspects of COVID-19-pandemie
- Green Deal, Renovation Wave
- Energy demand of data centers
- Energetic inspections of VAC-systems

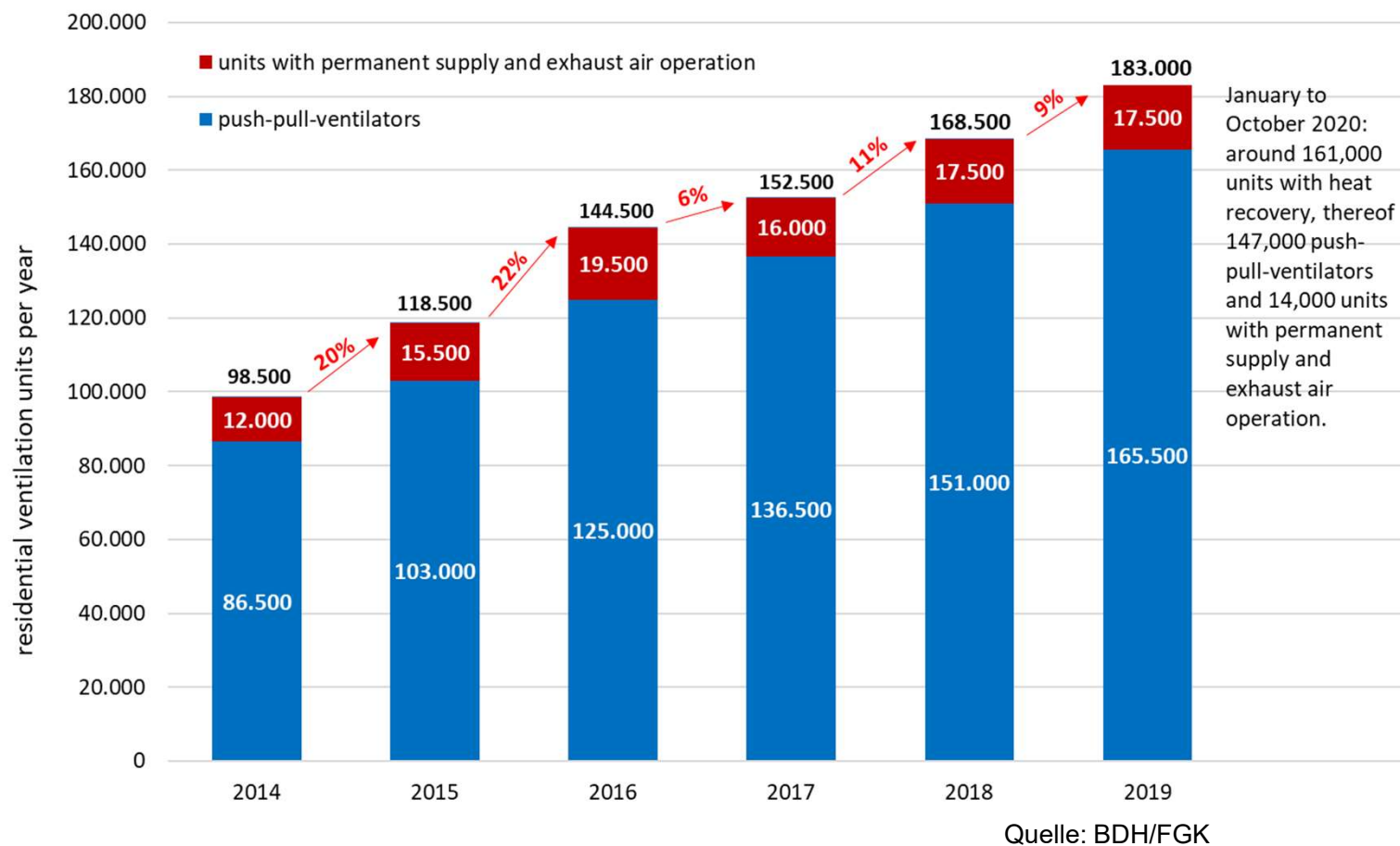
Development of Sales in Germany Central residential ventilation with heat recovery



Quelle: BDH/FGK

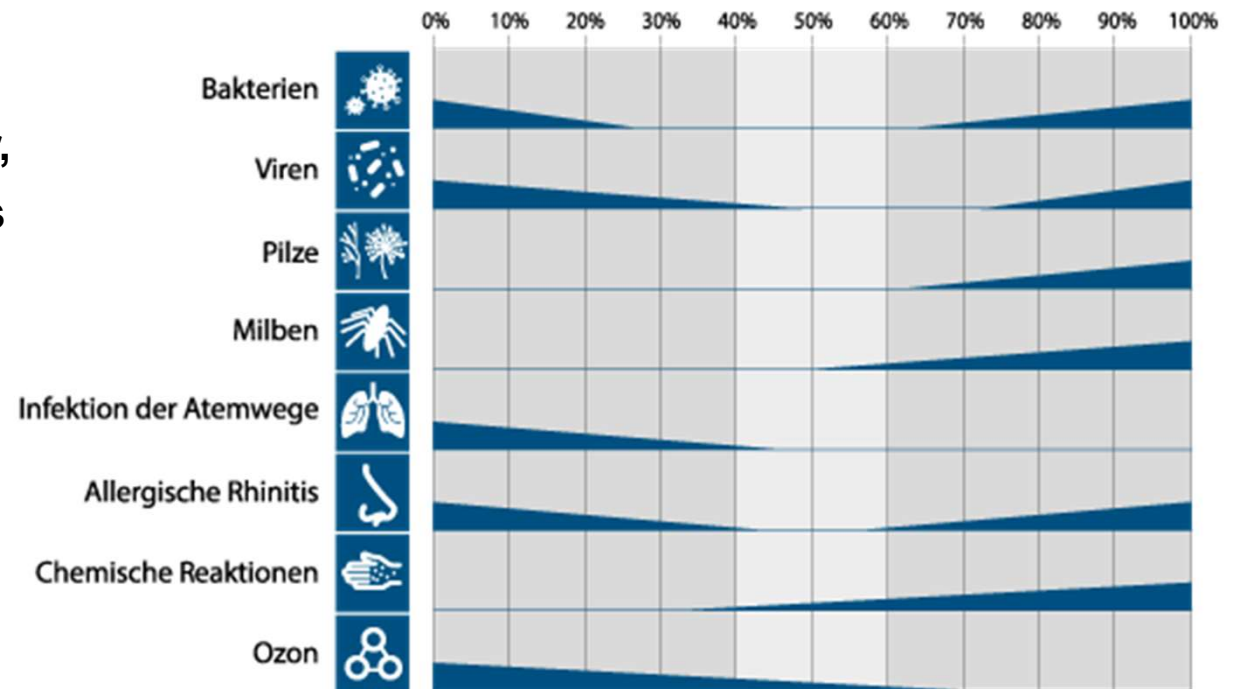
Development of sales in Germany

Decentralized, roomwise residential ventilation with heat recovery



Healthy Indoor Climate

- Efficient ventilation reduces the virus load in the room
- Heating the outside air at low outside temperatures reduces the relative humidity of the ambient air
- With low air humidity
 - the aerosols float longer in the air,
 - the ability of the respiratory tracts to resist pathogens is reduced.
- An air humidity of 40 to 60% is most favourable for the human immune system.



Fachverband Gebäude-Klima e. V.
nach Scofield und Sterling ASHRAE-Journal 34

COVID-19 Risk of Infection by Aerosols

- This App takes into account
 - length, width and height of the room,
 - number of adults in the room
 - activity of the persons
 - mouth-nose protection
 - ventilation and, if necessary, additionally available quantity of virus-free air, e.g. by air purifier
- It determines the potential risk of infection via indoor aerosols depending on the length of time spent in the room.



<https://hri-pira.github.io>

Raumvolumen

Länge in m	Breite in m	Höhe in m	Volumen in m ³
5	4	3	60

Anzahl der erwachsenen Personen im Raum. Eine davon wird als infiziert angenommen.

5

Aktivität

Sitzen, Stehen oder Sprechen

Mund-Nasen-Schutz (MNS) und Tragevariante

Kein MNS Rundherum eng anliegend

Belüftung

Gut Belüftet

Frischlufthmenge in m³/h

Produkt aus personenbezogener Frischlufthmenge durch Belüftung und der Gesamtzahl anwesender Personen

200

Zusätzlichen verfügbare Menge virenfreier Luft (z.B. durch Einsatz von Luftreinigern)

0

Gesamte virenfreie Zuluft

200

Infektionsrisiko bedeutet in dem hier betrachteten Zusammenhang das individuelle Risiko einer gesunden, erwachsenen Person, an COVID-19 zu erkranken. Es wird auf der linken Seite das Risiko in Prozent und auf der rechten Achse die Personenanzahl dargestellt, die sich sehr wahrscheinlich mit SARS-CoV-2 infizieren würden. Diese Anzahl wird aus dem Risiko in % und der Anzahl der gesunden Personen im Raum berechnet.

Quelle: Technische Universität Berlin, Hermann-Rietschel-Institut

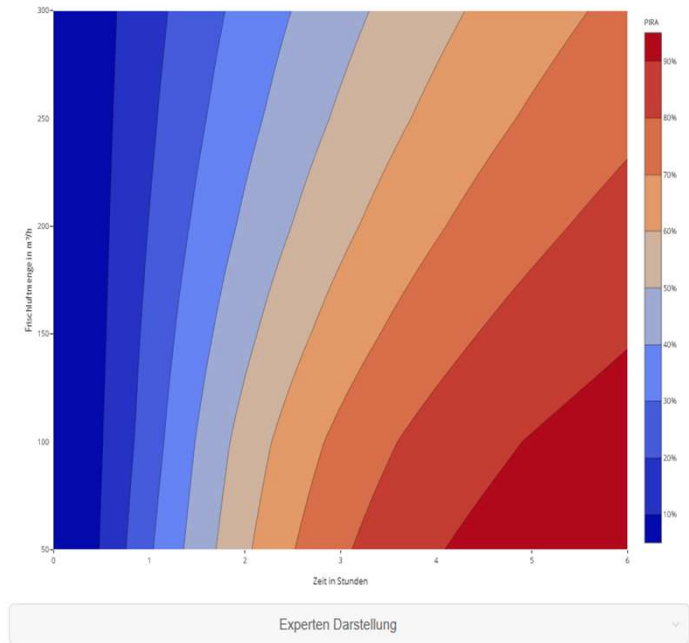
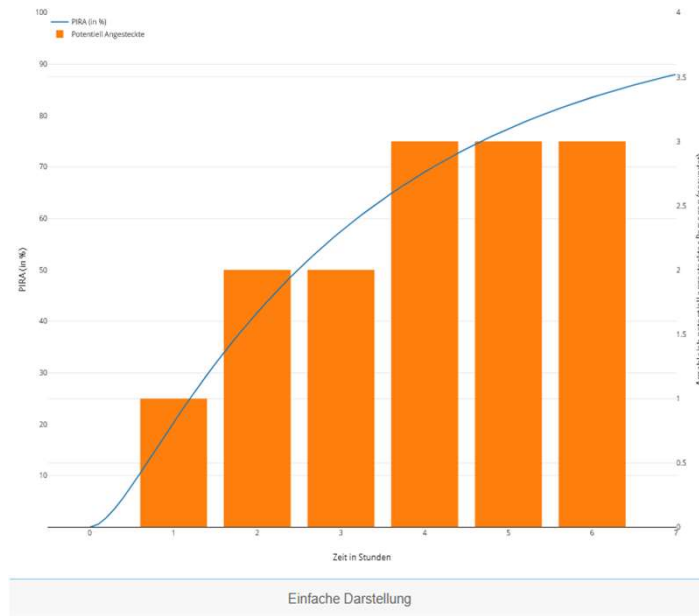
COVID-19 Risk of Infection by Aerosols



<https://hri-pira.github.io>

TU Berlin web app for calculating the potential risk of infection via aerosols

The calculations are based on the publication „Predicted Infection Risk for Aerosol Transmission of SARS-CoV-2“ (<https://doi.org/10.1101/2020.10.08.20209106>). The consideration of the wearing of a mask is based solely on the investigations of the Hermann Rietschel Institute of the TU Berlin.



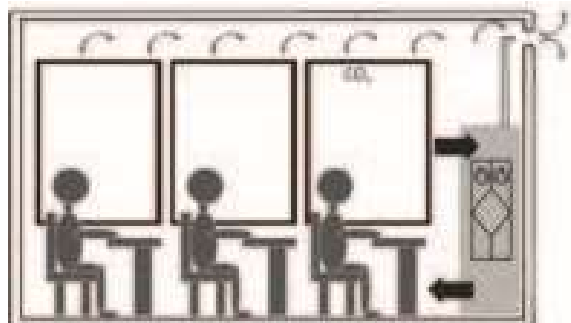
Quelle: Technische Universität Berlin, Hermann-Rietschel-Institut

Support for corona-compatible conversion and upgrading of air conditioning systems

- In October, the federal support came into force for corona-compatible conversion and upgrading of air conditioning systems in public buildings and places of assembly
- The following investments in public buildings and places of assembly will be supported:
 - Conversion or upgrading of existing air conditioning systems for rooms where large gatherings of persons regularly take place, i.e. meetings with a corresponding occupancy and service life of the room, and which are suitably documented in the application.
 - The following measures are explicitly mentioned:
 - Conversion of filters, change of filters, e.g. by replacing fine dust filters of class F7 with filters of classes ISO ePM1 70% or ISO ePM1 80%,
 - Upgrading with HEPA filters (HEPA - H 13 or H 14) in circulating air systems or secondary air systems, provided this is technically possible in existing installations.
 - Measures to avoid or reduce air re-circulation and to increase the proportion of fresh air or outdoor air (fresh air supply), including measures to maintain the usage requirements for the room (e.g. indoor temperature) while increasing the proportion of fresh air or outdoor air.
 - Conversions of the air conditioning systems through the addition of infection-proofed filter stages,
 - Installation of control and regulation for the demand-oriented operation of air conditioning systems, especially with CO₂ sensors,
 - Elaboration of a concept for the infection-proofed ventilation using the air-conditioning system to be converted.



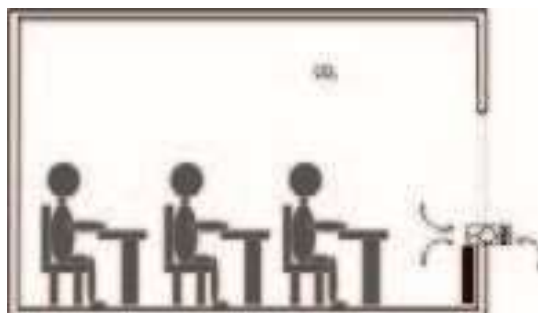
Quelle: Rosenberg Ventilatoren GmbH



**Stand alone, roomwise fix installed
AHU especially for schools**



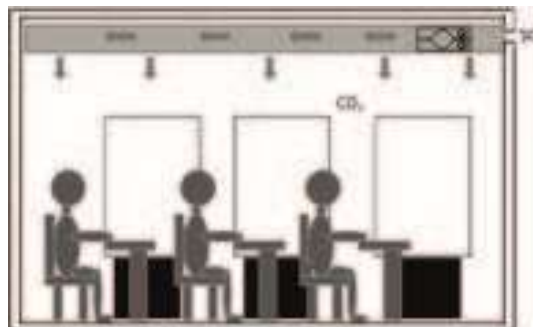
Quelle: TROX GmbH



**Systems with ventilation via railings or
facade**



Quelle: LTG AG



Ceiling systems



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Quelle: WOLF GmbH



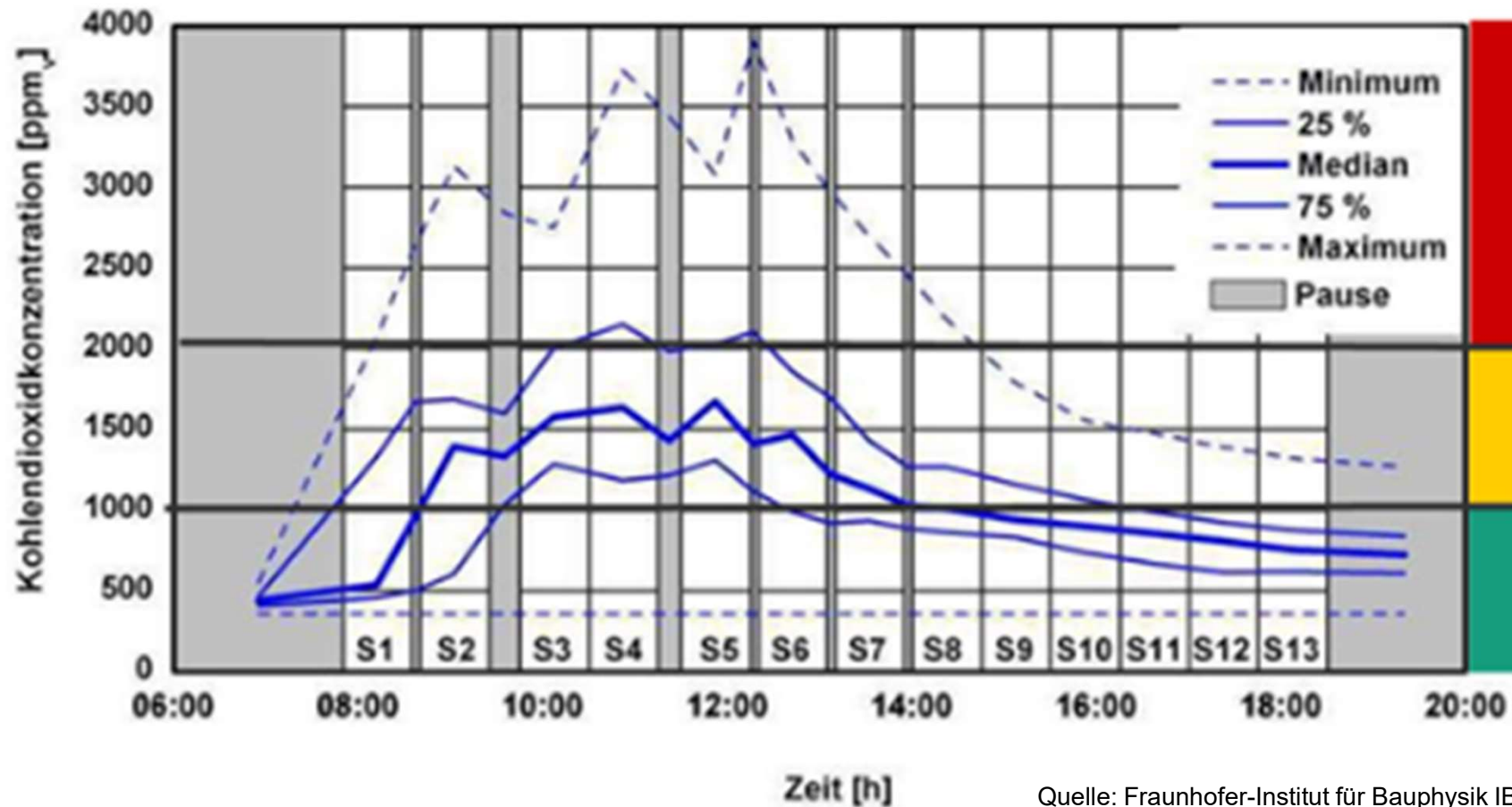
Quelle: TROX GmbH

■ German UBA-Guidelines on CO₂ in schools

CO ₂ - concentration [ppm]	Hygiene assessment		Recommendations
< 1000	Acceptable	Green	No further requirements
1000 - 2000	Noticeable Conspicuous	Yellow	Consider further ventilation actions: Raise ventilation rate, Improve ventilation
> 2000	Not acceptable	Red	Check possibilities of ventilation Check further solutions

Quelle: UBA

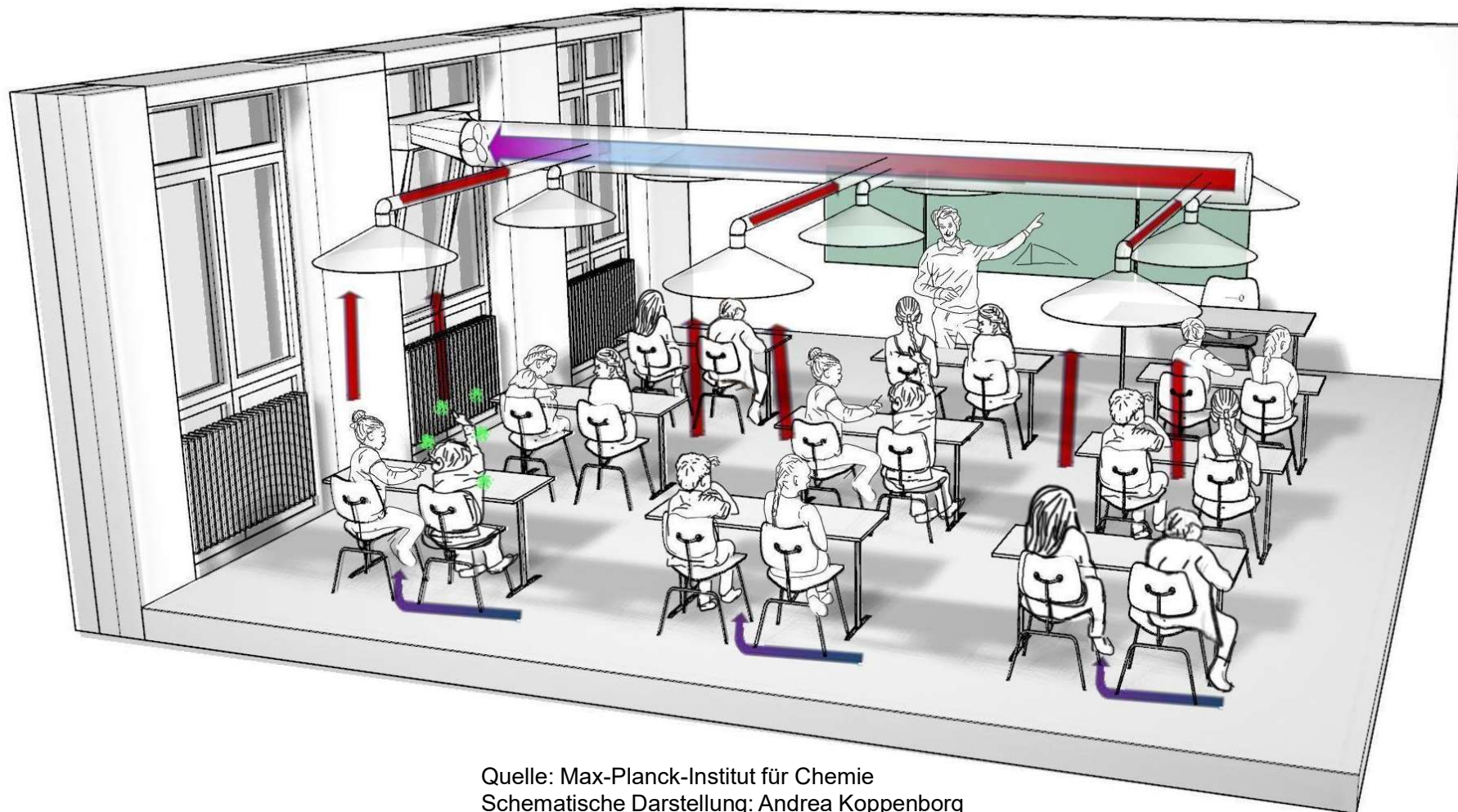
CO₂-concentration during the day



Quelle: Fraunhofer-Institut für Bauphysik IBP

Quelle: Max-Planck-Institut für Chemie, Foto: Elena Klimach





Quelle: Max-Planck-Institut für Chemie
Schematische Darstellung: Andrea Koppenborg

Thank you for your attention and keep always cool
with an appropriate and efficient AC-system

