



SCHOOLVENTCOOL

Requirements and Solutions

**for high performance
school renovations**

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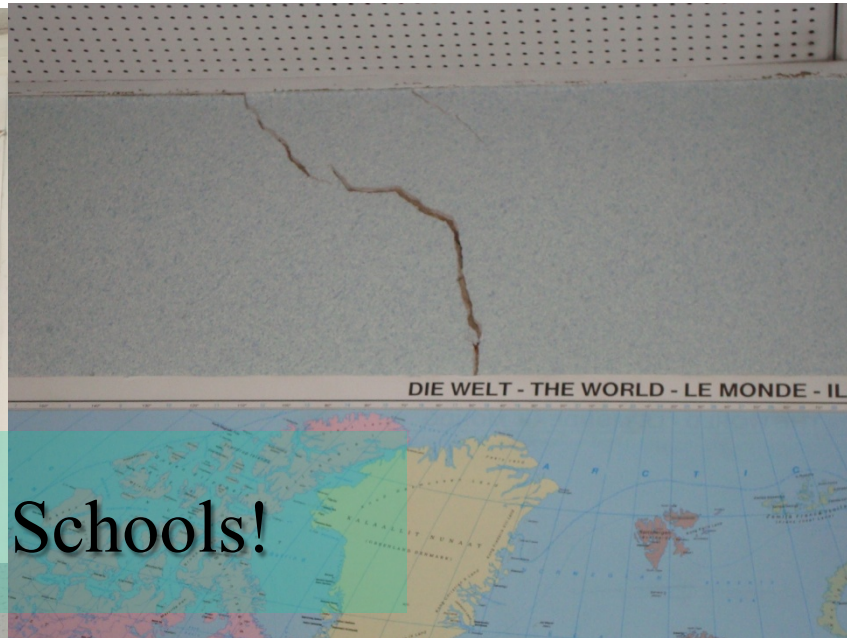
OVERVIEW



EXISTING SCHOOLS



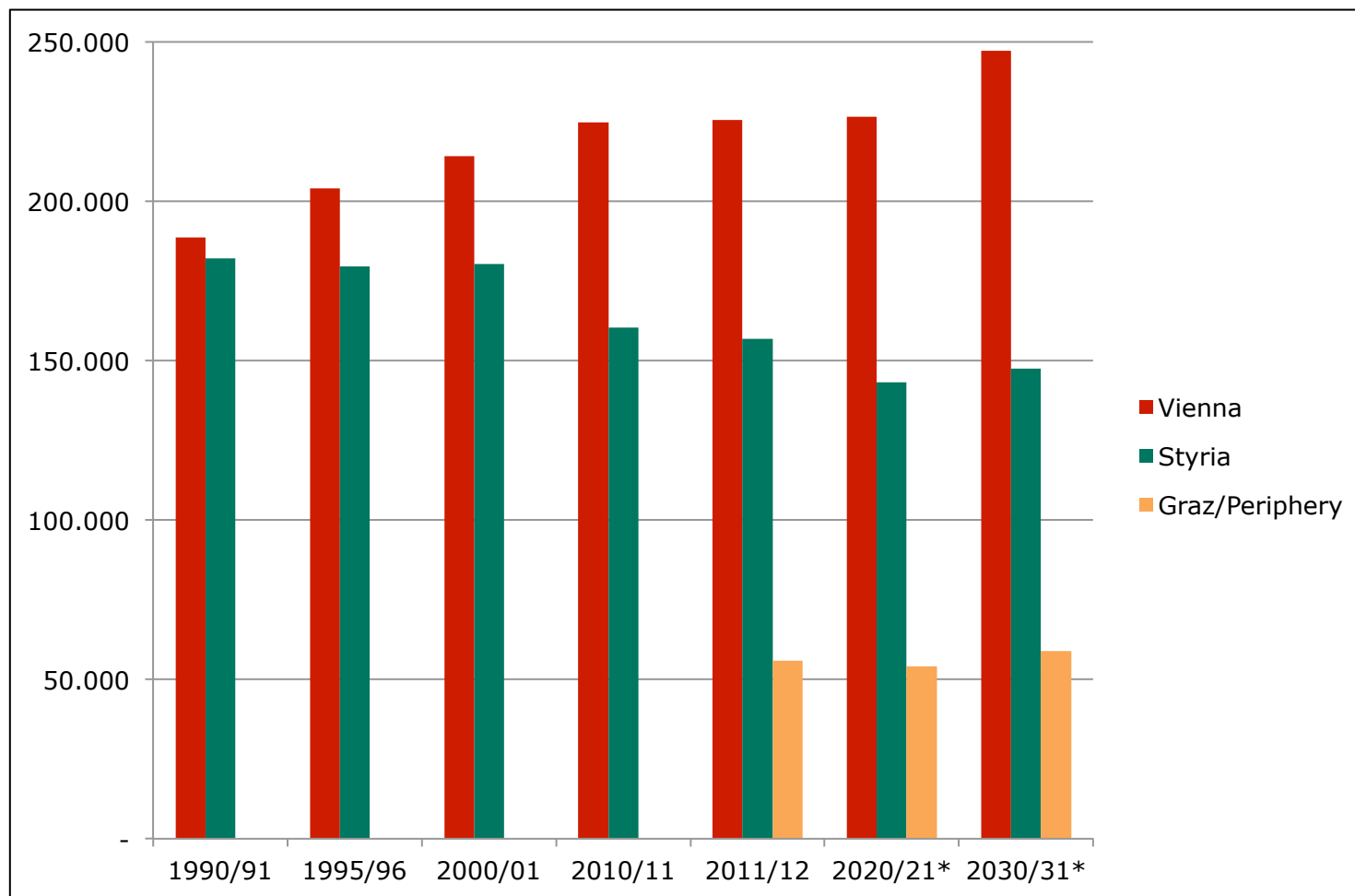
EXISTING SCHOOLS



Reality in Schools!



PUPIL NUMBERS



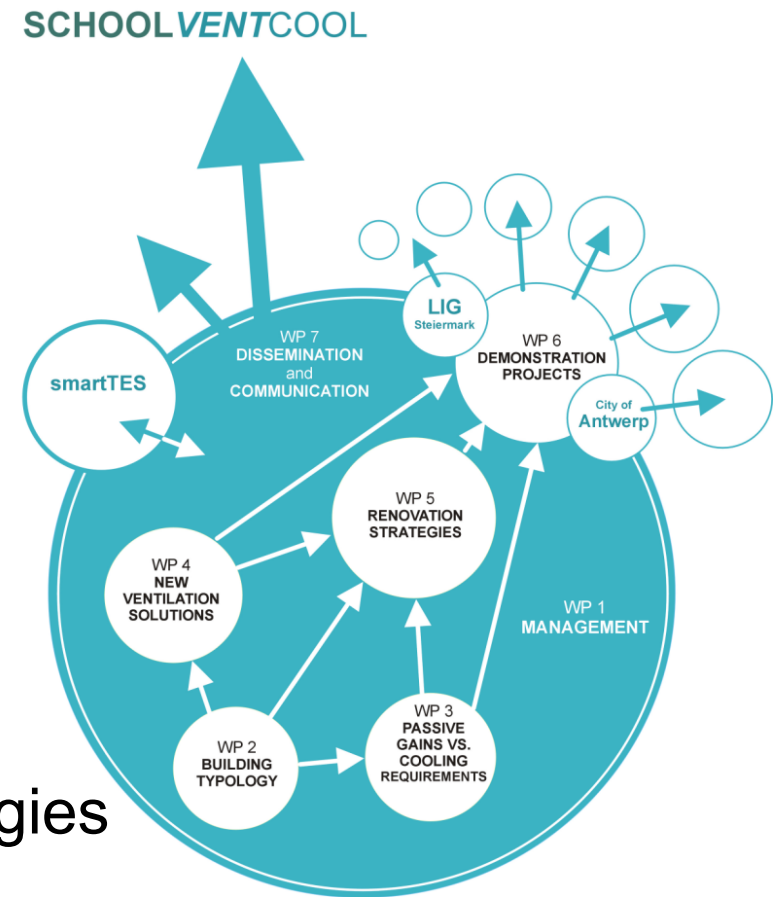
Source: Statistics Austria, AEE INTEC

* Projection Statistics Austria, made in 2012

Eracobuild *-project:

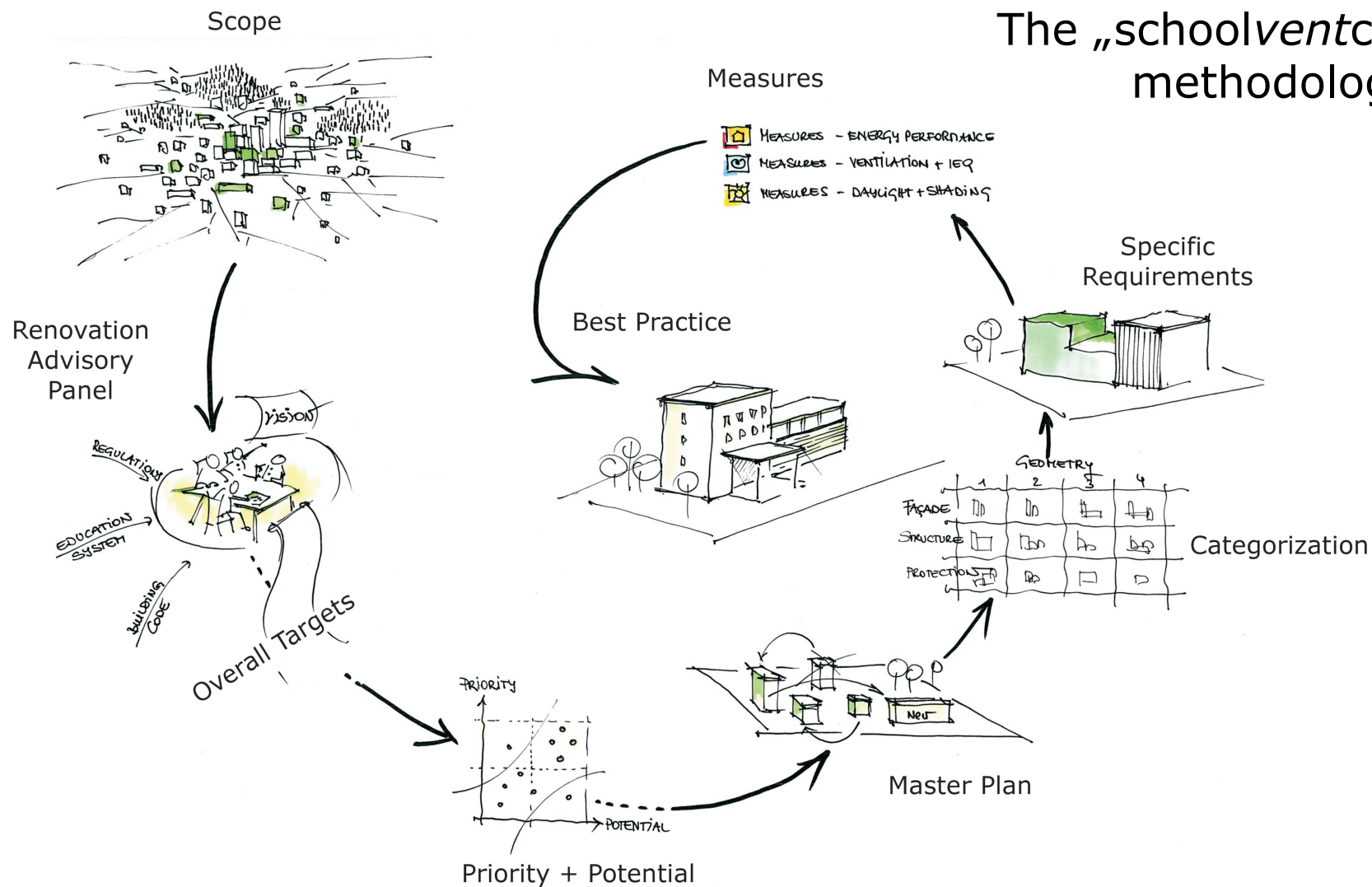
7 partners from Belgium, Denmark,
Switzerland and Austria (coordination)

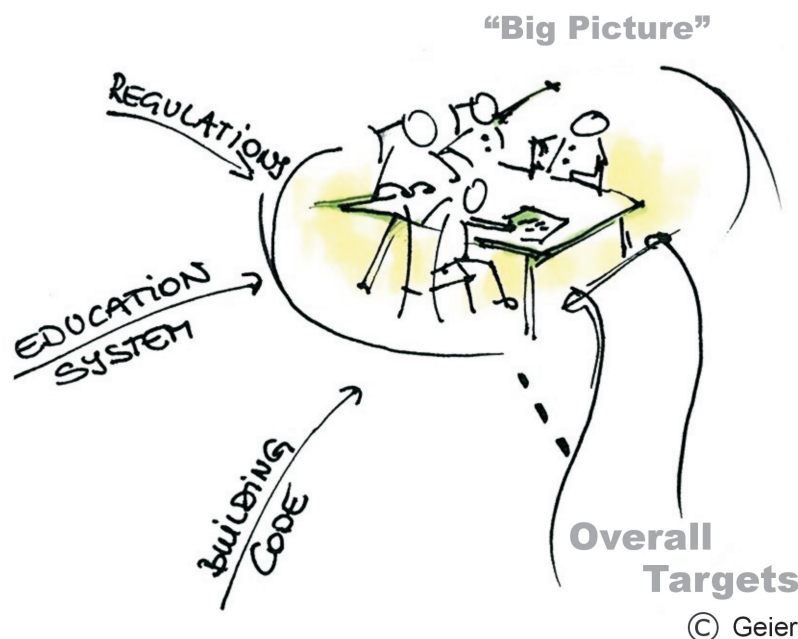
SCHOOL – school renovation strategies
VENT – ventilation solutions
COOL – passive cooling solutions (shading)



*Strategic Networking of Research Development Innovation Programmes in Construction and Operation of Buildings

RENOVATION STRATEGY





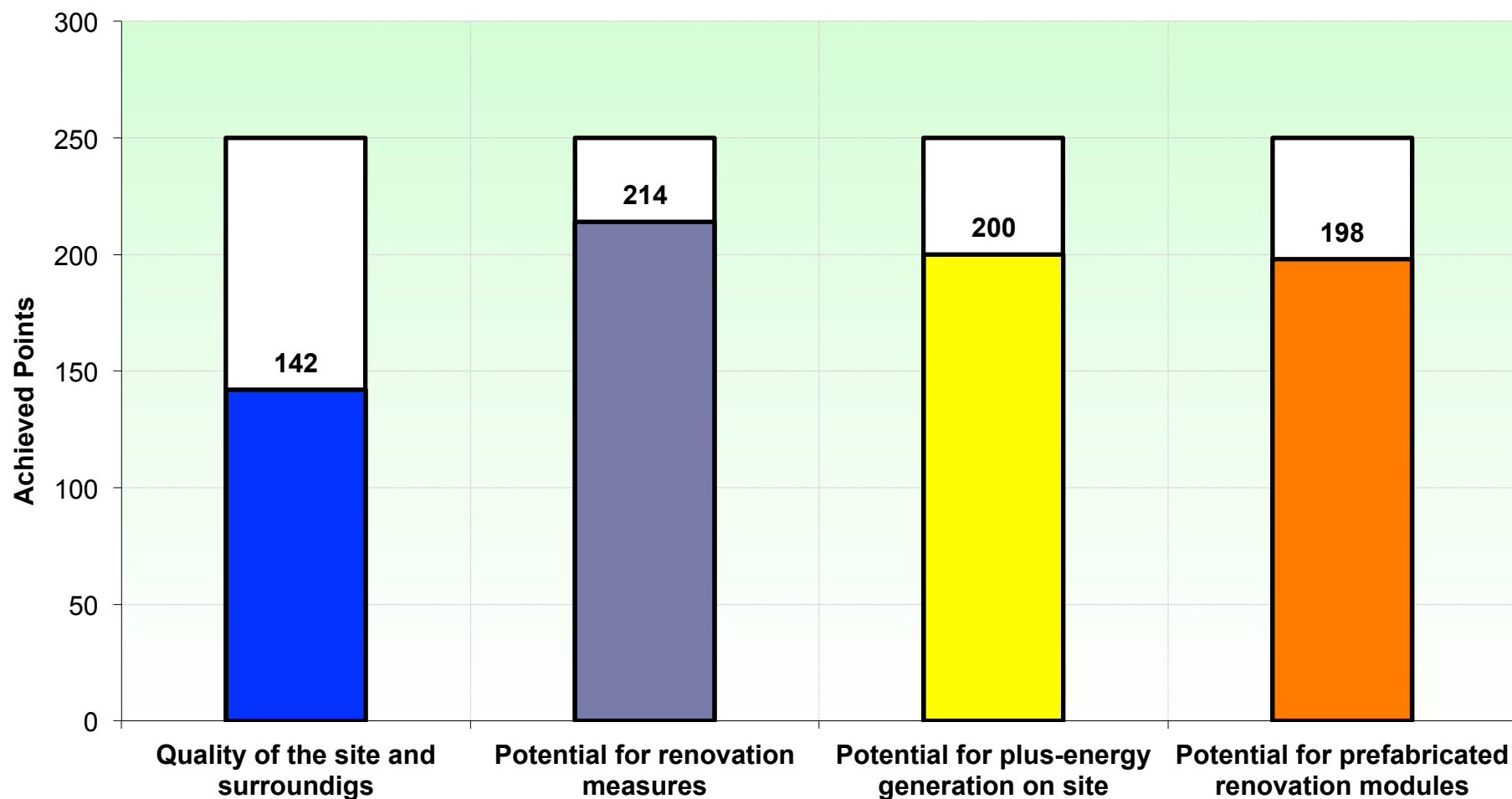
Overall targets for:

- Functional Usage
- Educational Utilization
- Energy Performance
- Indoor Environmental Quality
- Life cycle aspects

→ General Guidelines

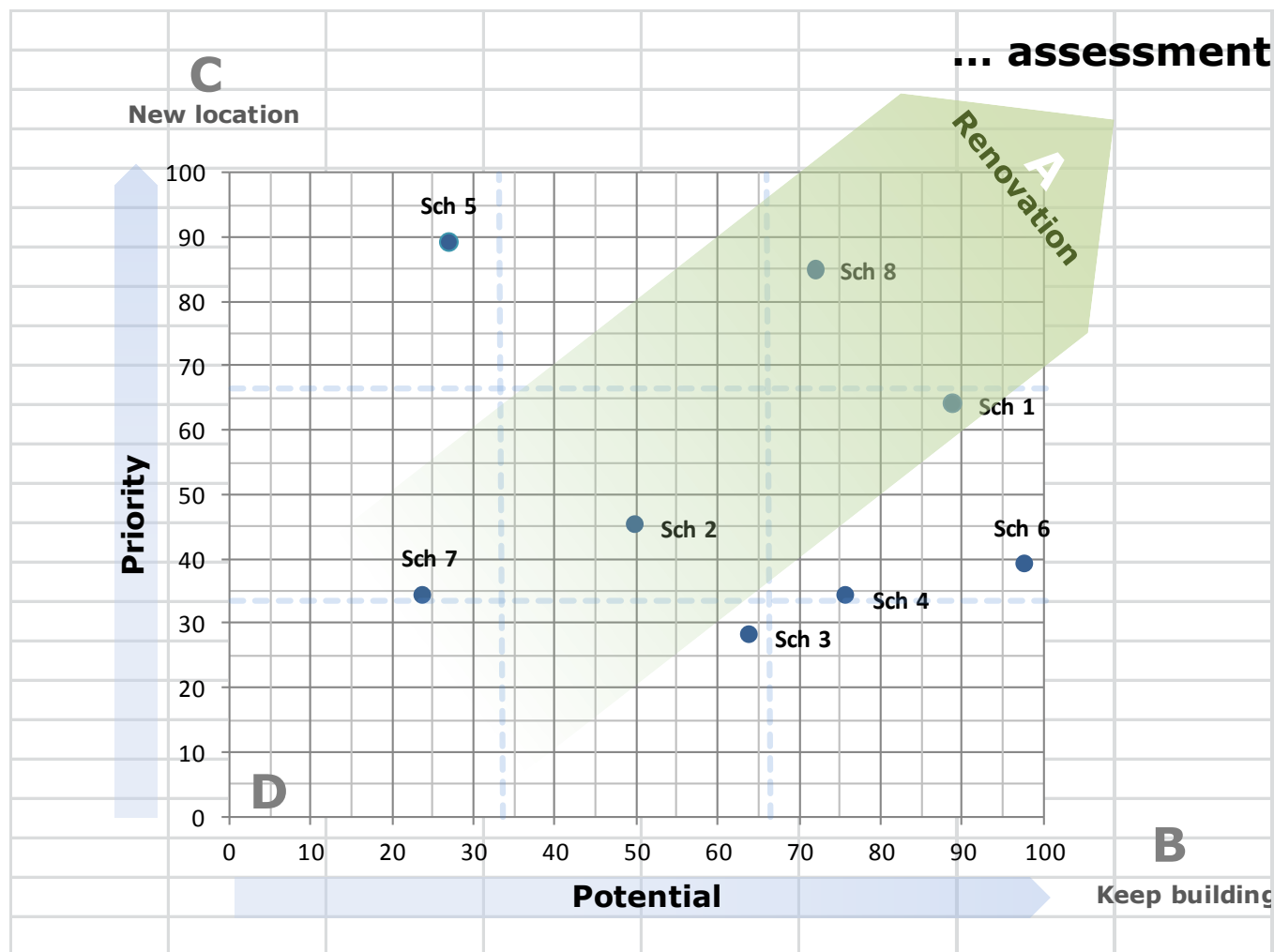
... clear, quantifiable, achievable!

POTENTIAL ANALYSIS



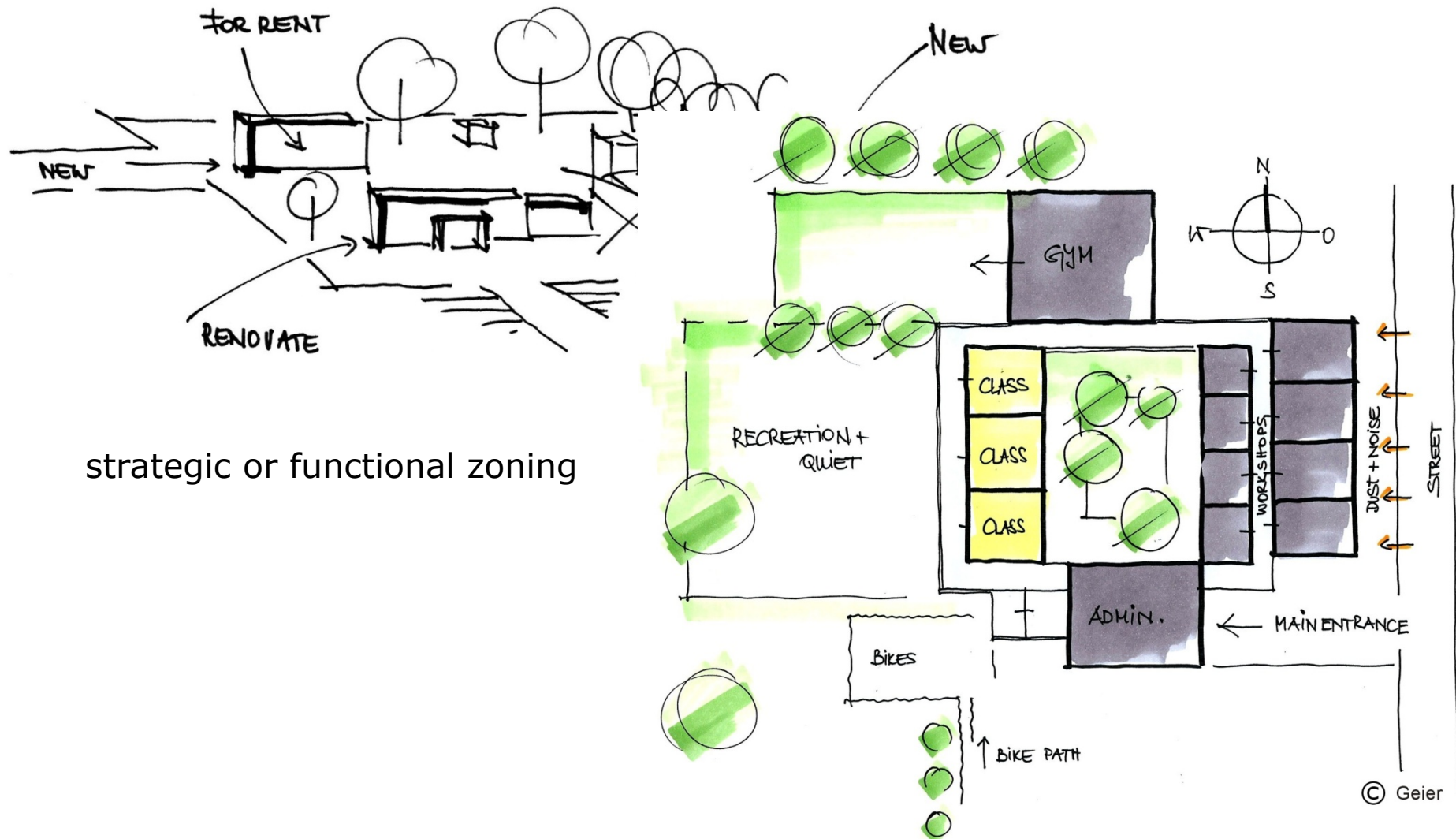
Criteria Catalogue – Assessment results!

PRIORITY - POTENTIAL


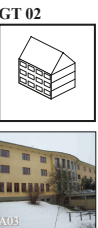
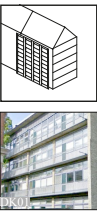
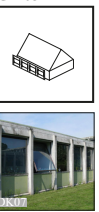


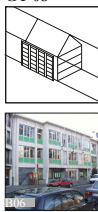
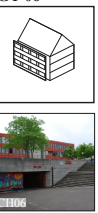
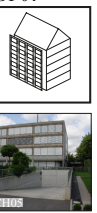


Potential-Priority-Matrix – supports decision making!

... for a cluster of school buildings

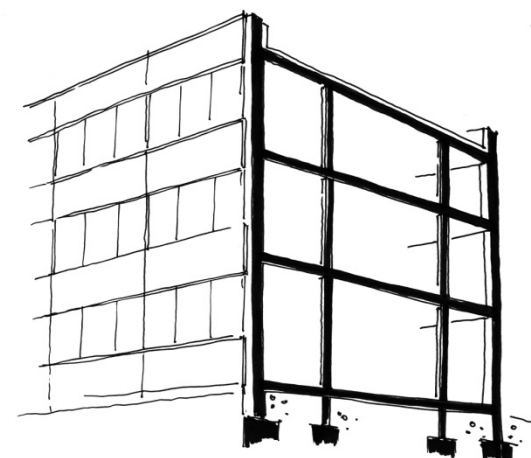
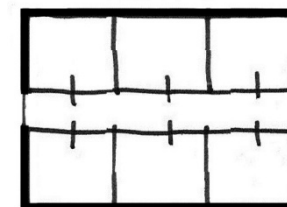
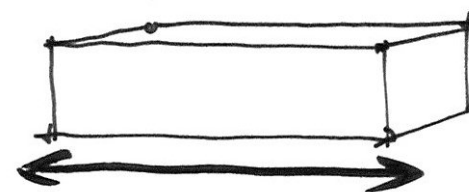


CATEGORIZATION

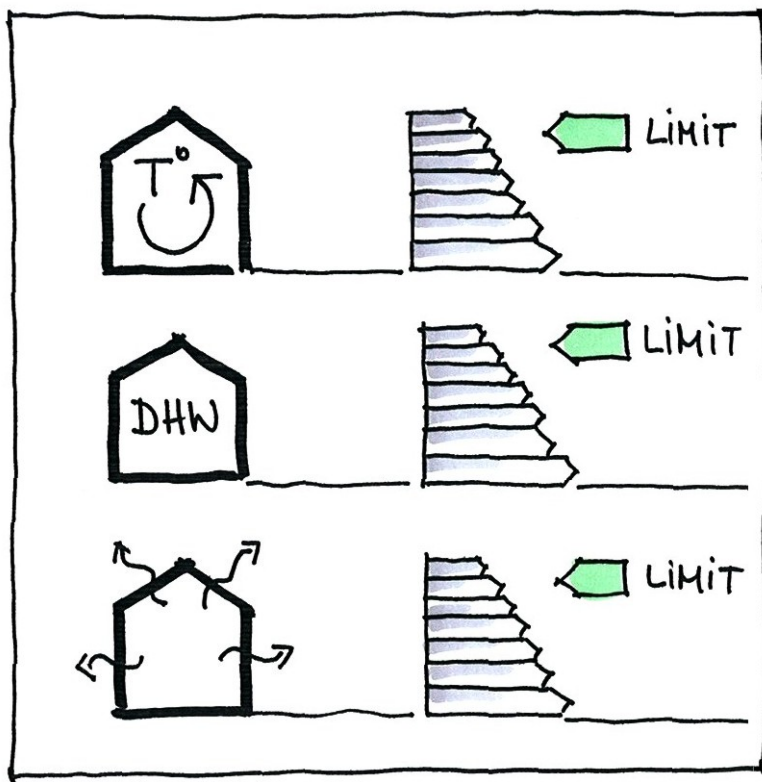
		Position in construction								
		End structure			Freestanding structure			Middle structure		
		Storeys			Storeys			Storeys		
		1	2-3	3+	1	2-3	3+	1	2-3	3+
Type of facade	Punctuated facade				GT 05 	GT 02 				
	Skeleton facade			GT 09 	GT 03 	GT 01 	GT 07 	GT 08 		
	Bended facade				GT 06 	GT 04 				

Source: FHNW

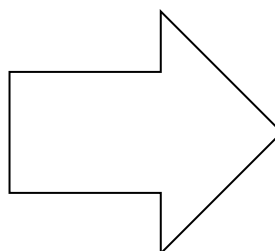
... Typology



INTO PRACTICE...

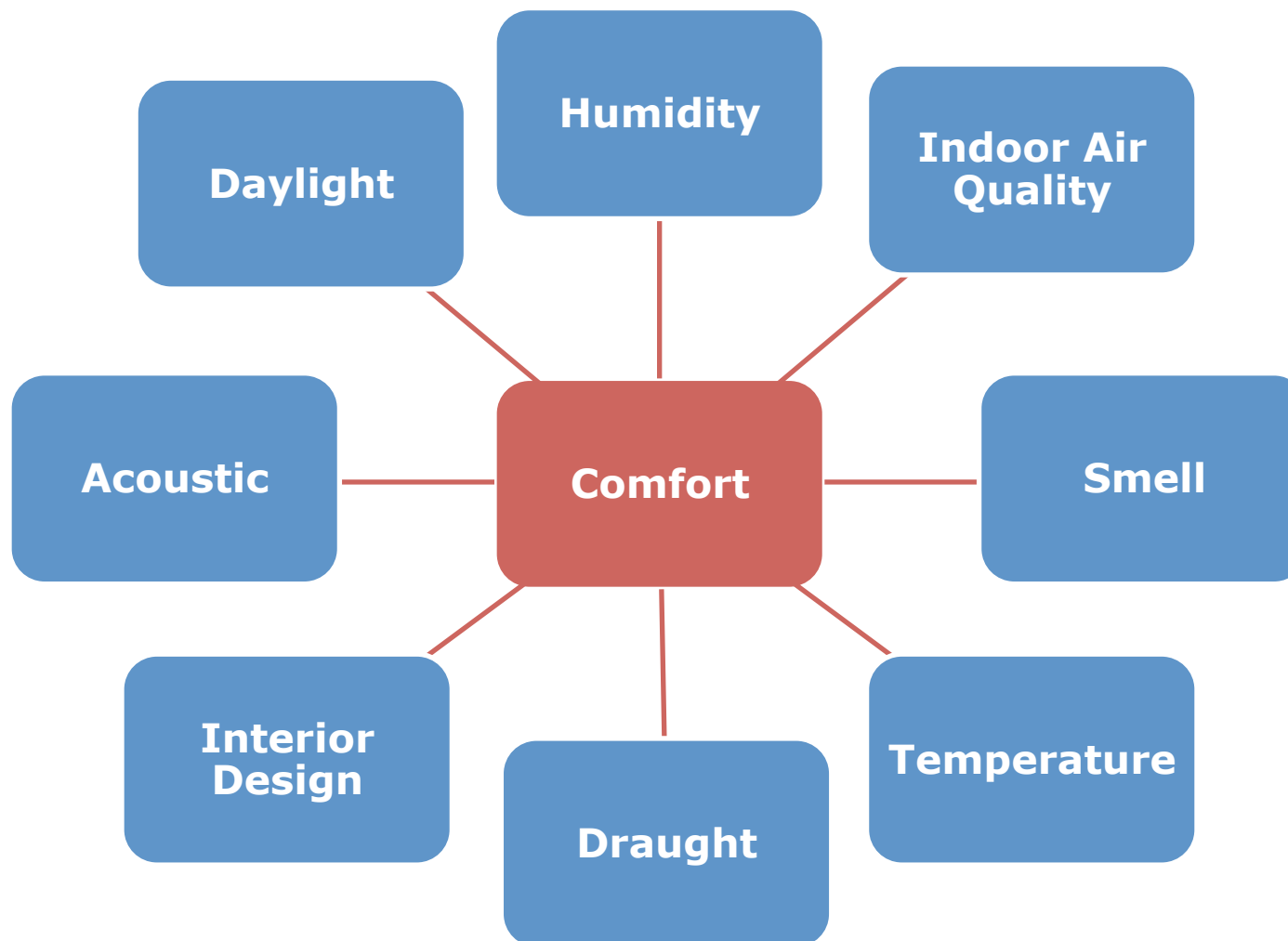


Specific Requirements



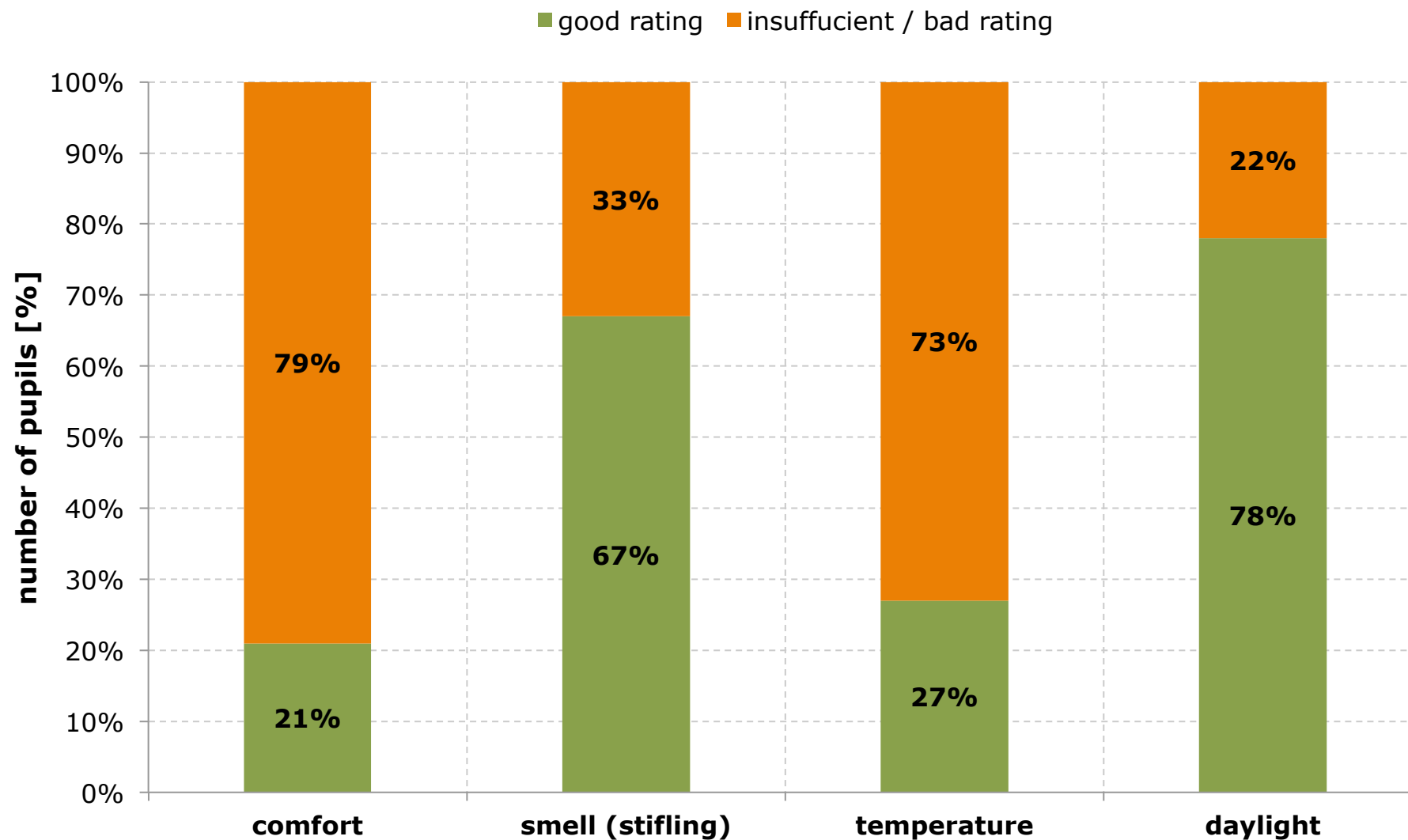
Passive and
Active
Measures

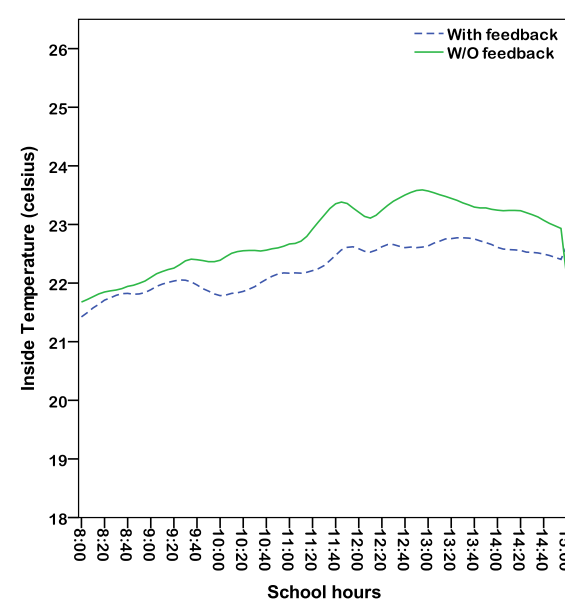
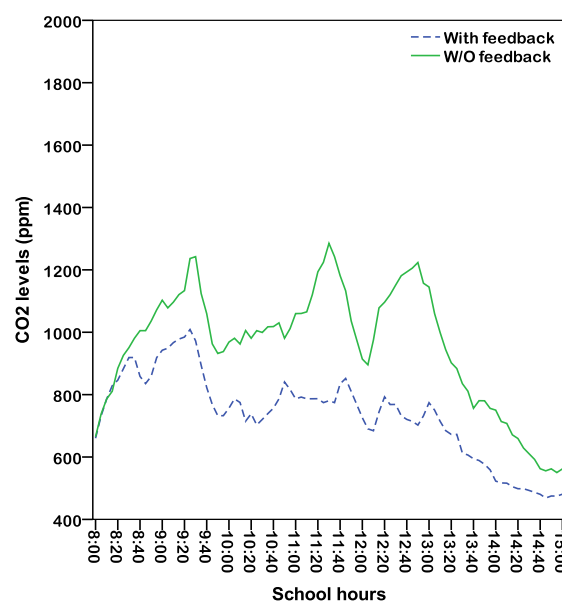
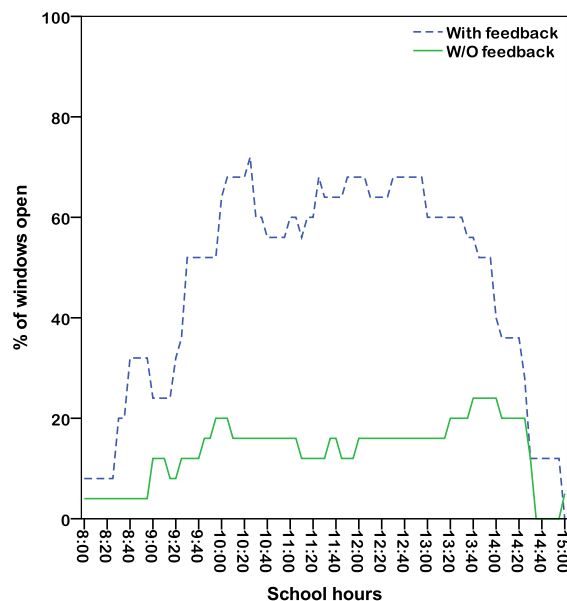
REQUIREMENTS



Areas of Quality:

- **Visual Comfort** (Sun-/Glare-Protection, Daylight-Factor, free sight to the outside, interior design and colours)
- **Thermal Comfort** (Winter AND Summer)
- **Humidity Comfort** (not beneath 30% r.H.)
- **Olfactory Comfort / Air Quality** (CO₂-Concentration <1.000ppm, free of pollutants, air-ions-concentration)

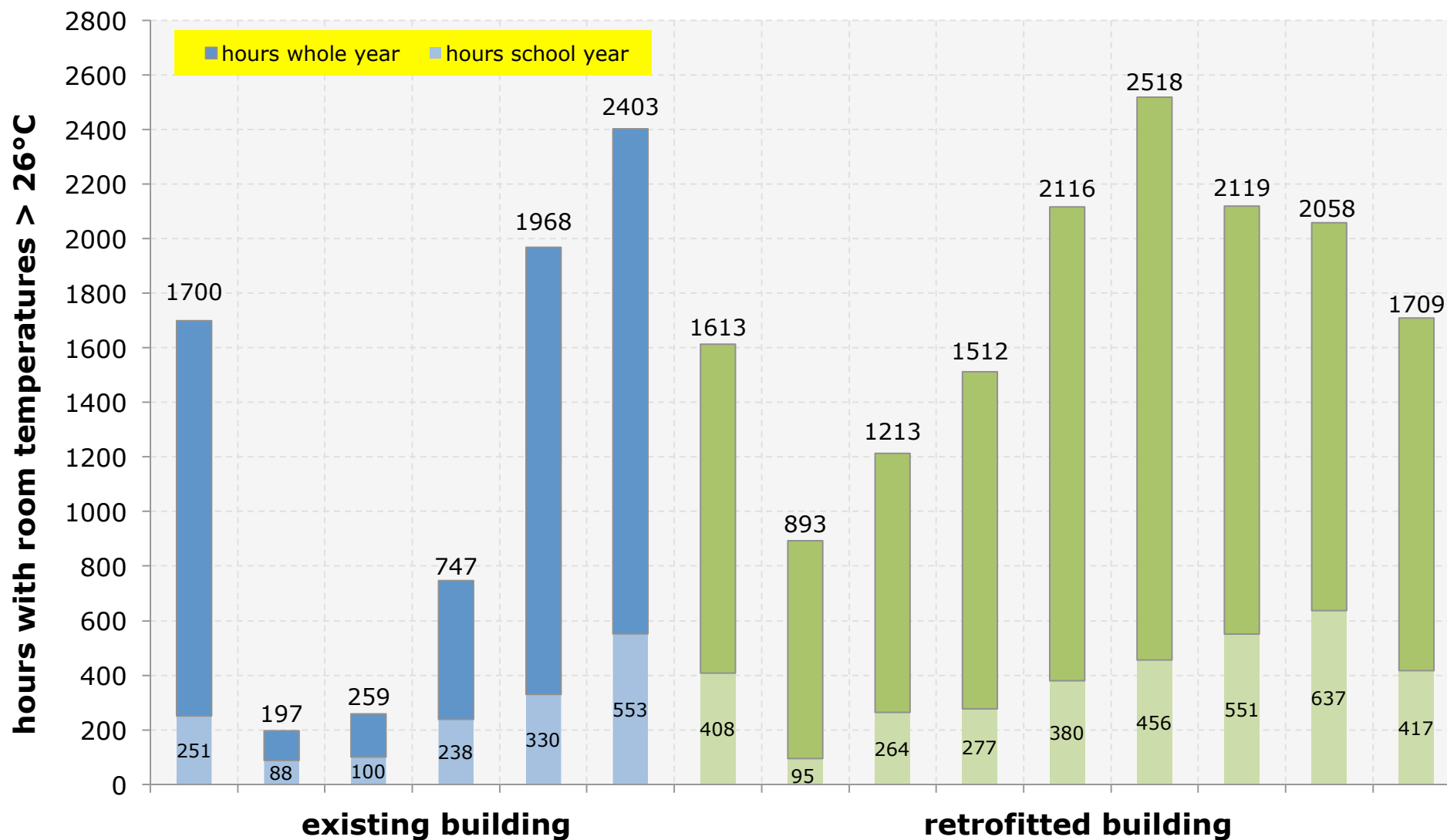




Source: DTU

If the classroom temperature is in a comfortable range, the pupils tend not to open the windows though they lack of good air quality!

OVERHEATING





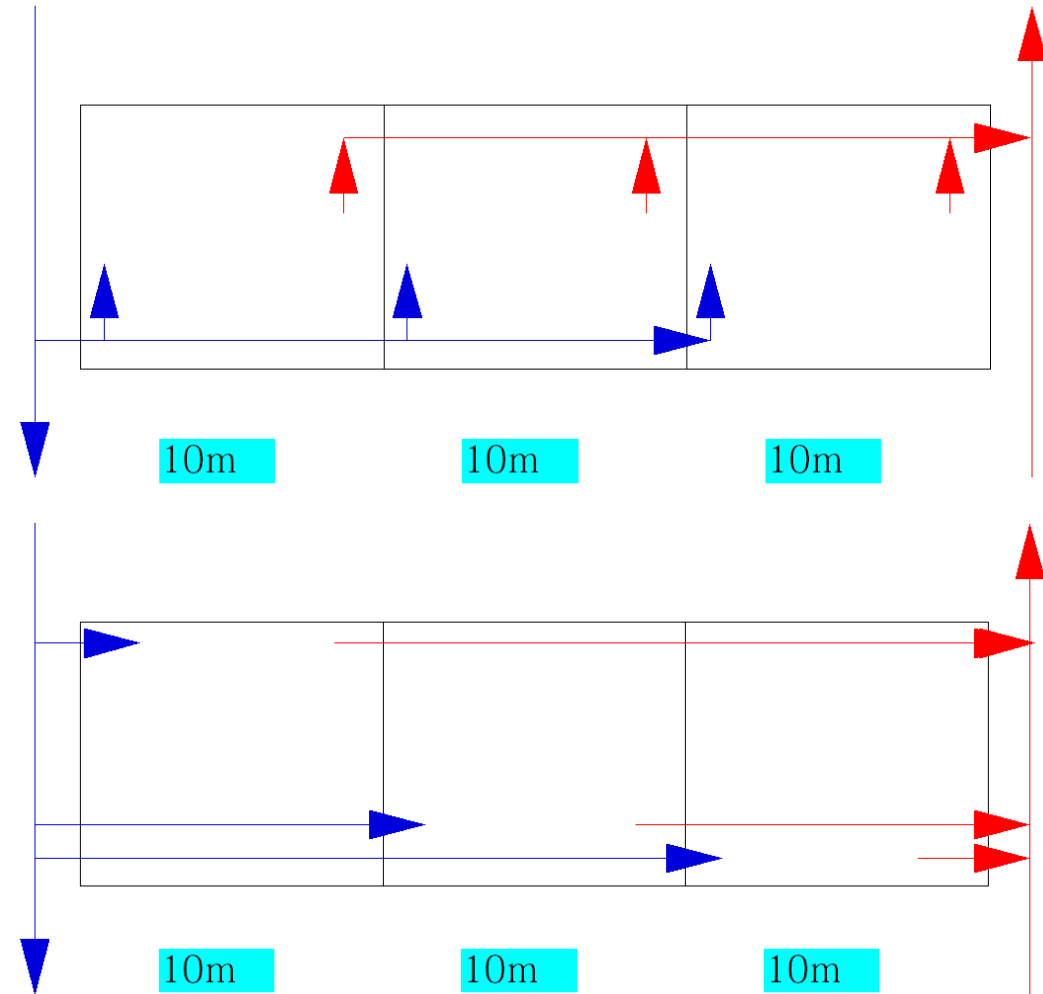
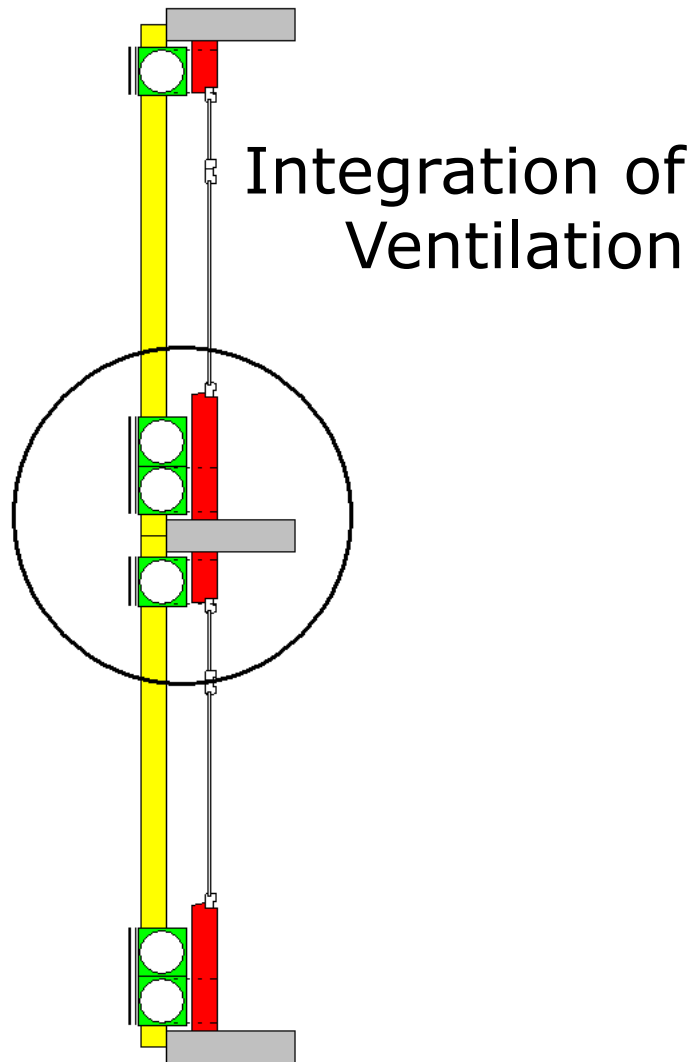
Upgrade the
shading system!



Source: BVST, J. Gerstmann

Prefabrication of insulated wooden elements

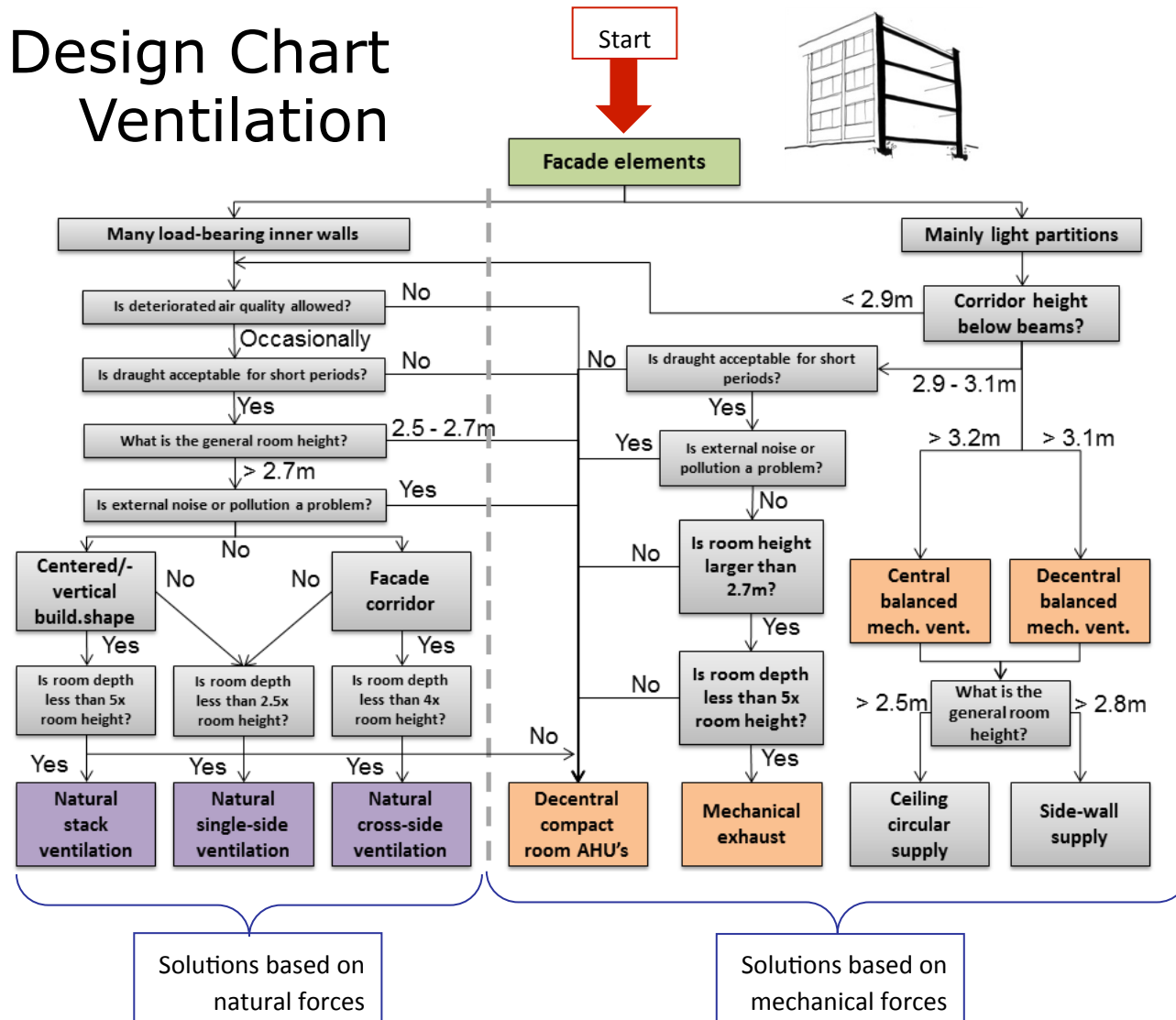




Source: FHNW

MEASURES

Design Chart Ventilation



Source: DTU

Neumarkt



Neumarkt



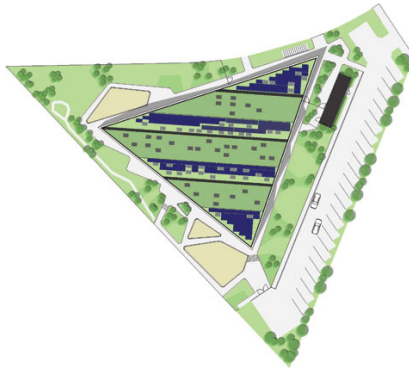
Ishøj DK





INTERNATIONAL

SCHOOL VENTCOOL
HAUS
der Zukunft



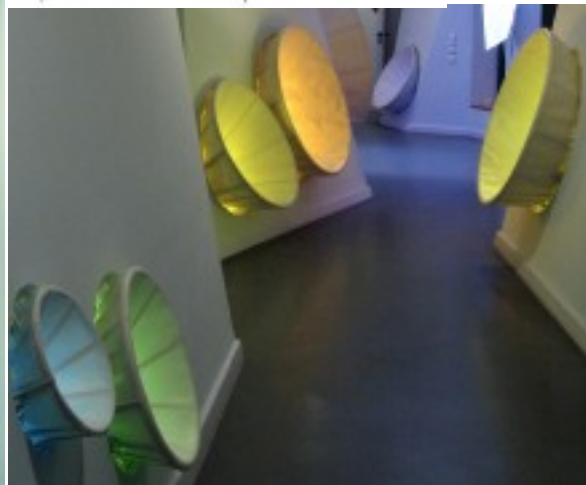
Source: VELUX A/S,
AEE INTEC



Hørsholm DK



Berlin DE



Source: Arch. DI Susanne Hofmann BDA
www.baupiloten.com

We need criteria based renovation concepts first on the portfolio down to the single building level

Thermal summer comfort is a serious challenge and has to be considered in the early planning stage

Measures need to include (night) ventilation as well as daylight integrating shading solutions

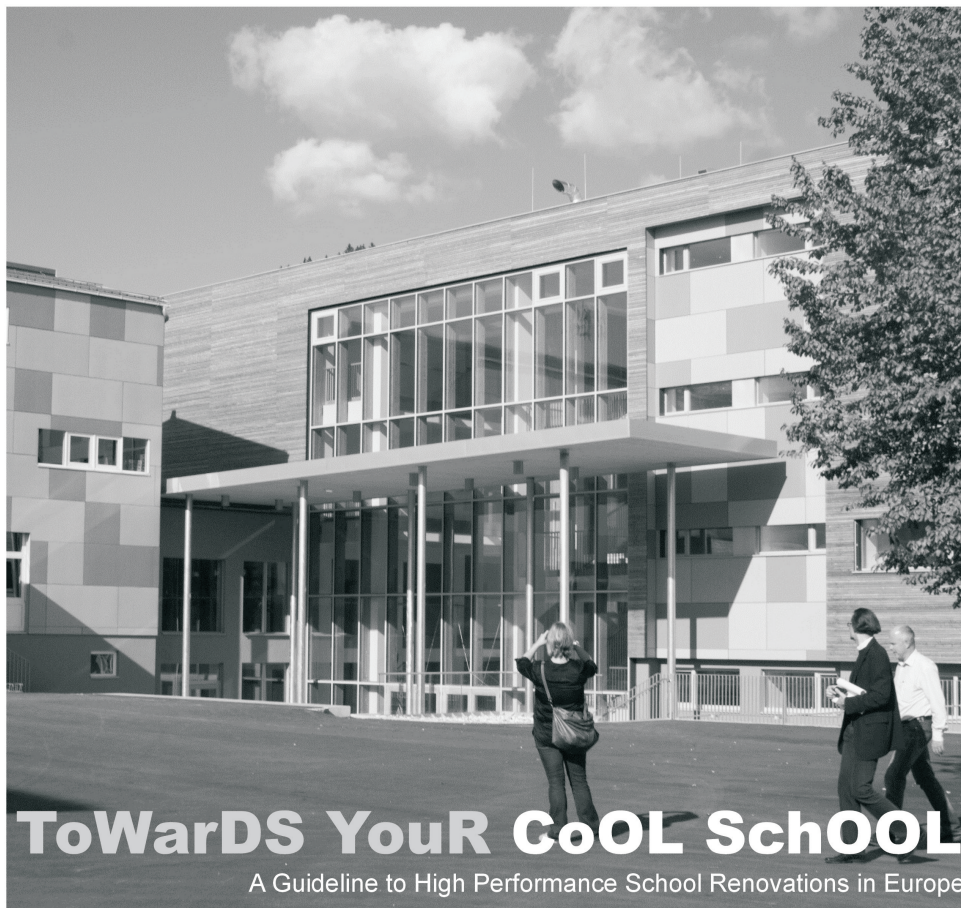
Do not forget to design open minded school building integrating energy AND comfort aspects!



BROCHURE

.....

SCHOOL VENTCOOL
HAUS
der Zukunft



Eracobuild



SCHOOL VENTCOOL 2009-2013



THE CONSORTIUM



Coordinator

AEE - Institute for Sustainable Technologies (AEE INTEC), experience of building renovations and innovative sustainable technologies, Austria



Hochschule Luzern Technik & Architektur (HSLU), Competence Centre of Typology and Foresight in Architecture (CCTP), Switzerland



Fachhochschule Nordwestschweiz (FHNW), Hochschule für Architektur, Bau und Geomatik, Institute of energy in building, Switzerland



DTU Technical University of Denmark, Civil Engineering - Building Physics and Services (DTU – BPS), Denmark



DTU Technical University of Denmark, Civil Engineering - International Center for Indoor Environment and Energy (DTU – ICIEE), Denmark



Passiefhuis-Platform vzw (PHP), Belgium



City of Antwerp, Cabinet vice mayor for education, work & economy, City of Antwerp Stedelijk onderwijs, Belgium

SCHOOL RENOVATIONS

**„The freedom of adults
has a name: It is called
responsibility.“**

(Joachim Gauck)

Are there accordances with the educational system?

www.schoolventcool.eu



Thank you for your attention!