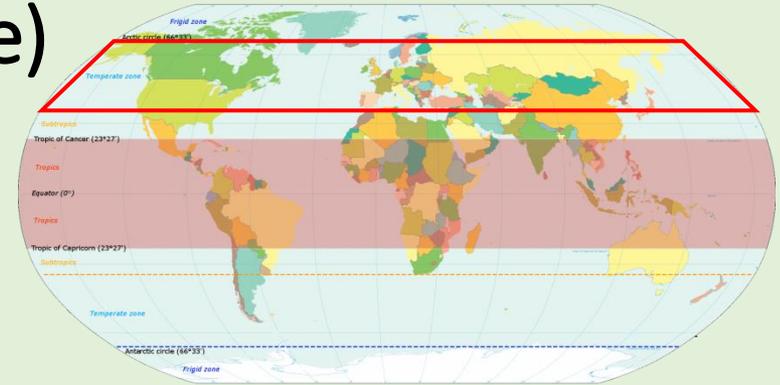




# Principles of low-energy storage buildings (in a temperate climate zone)



- A highly insulated building envelope (superstructure), which reduces temperature variations
- High thermal inertia, using the ground below base for heat storage
- No active heating
- Low air exchange rate, no forced ventilation
- Mechanical dehumidification if necessary; can be driven by solar power



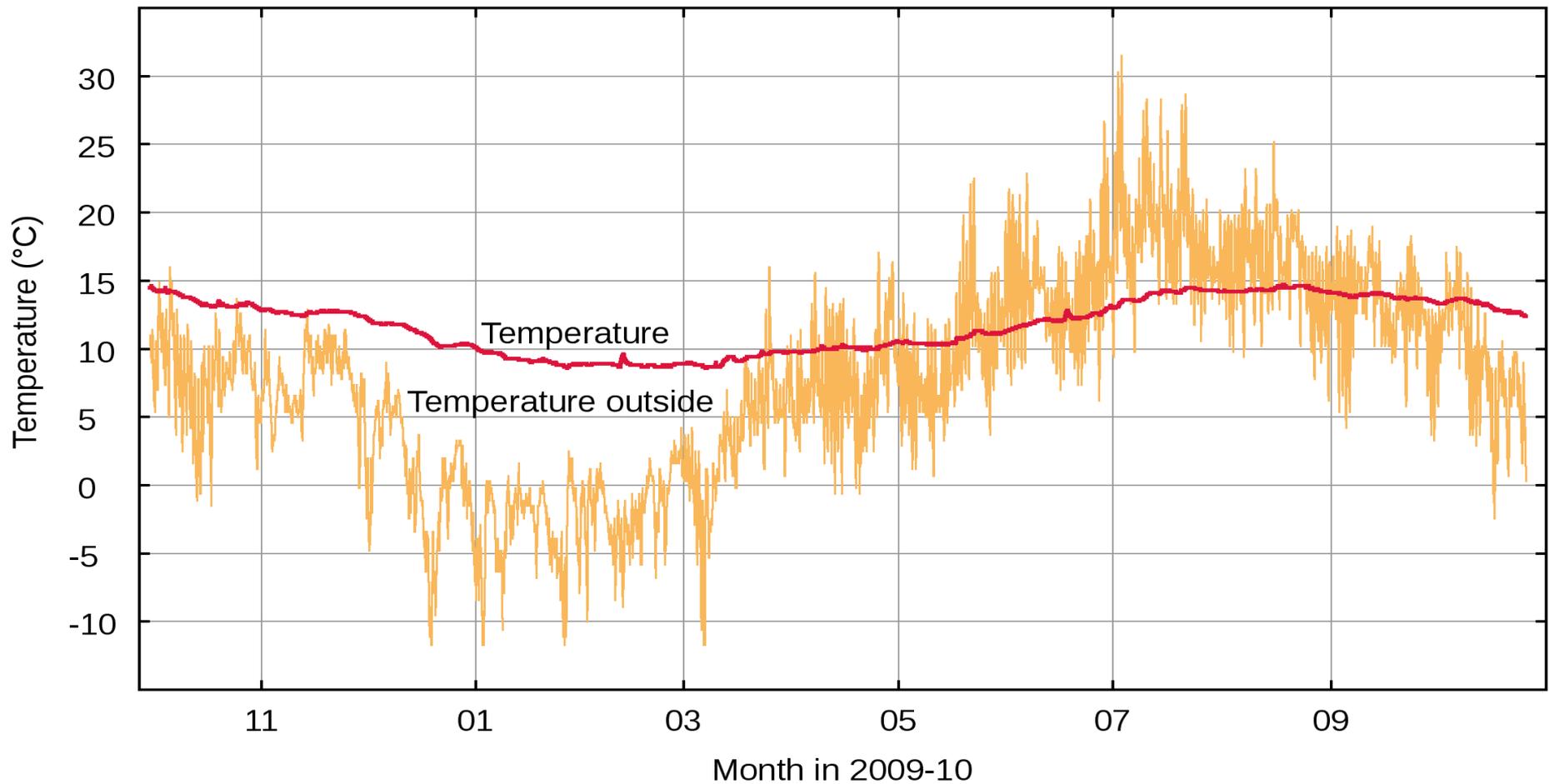
Museum storage facility for museums in Ribe (DK) 2006

# Inside the Ribe building: main storage (50% RH)

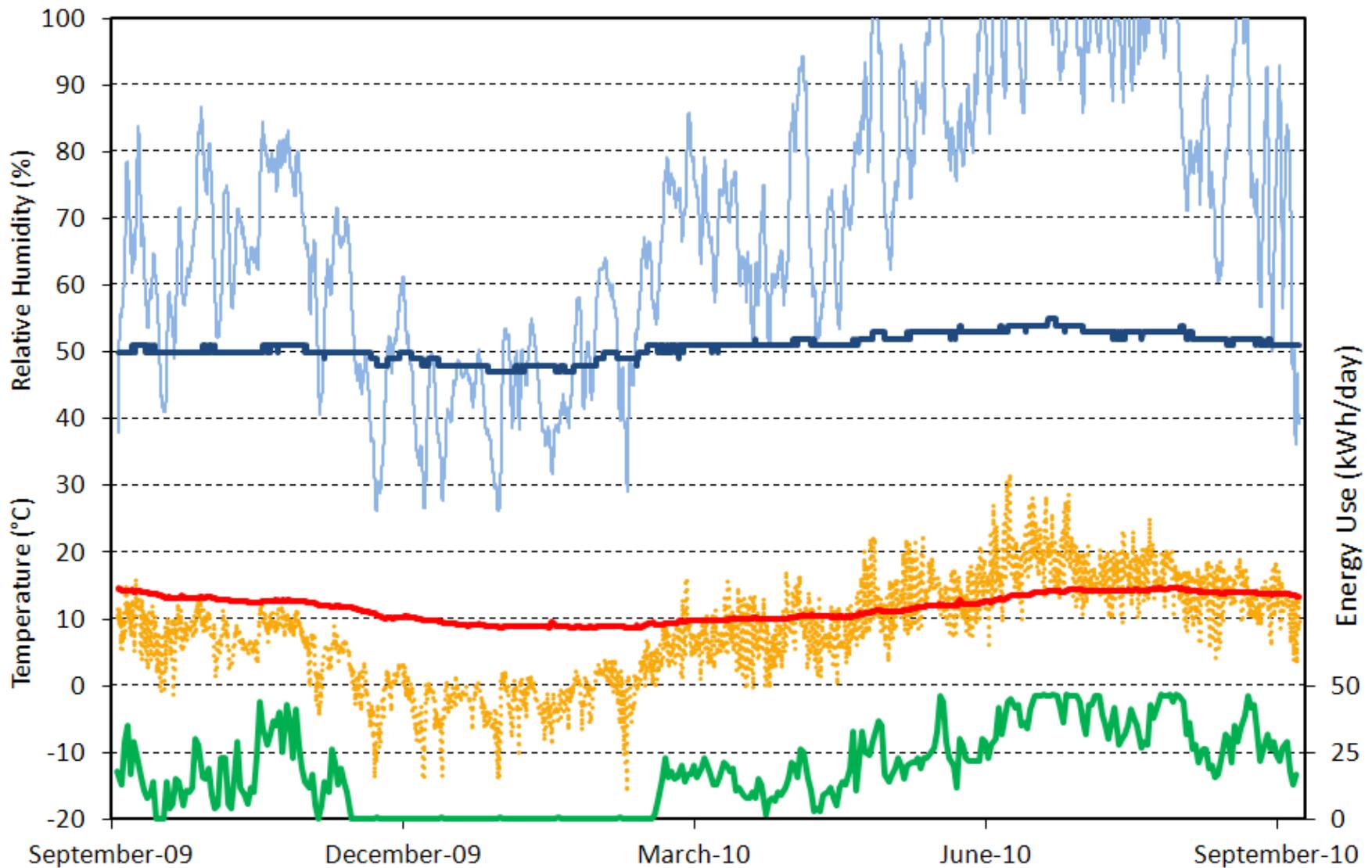




Inside the Ribe building: Dry store (30% RH)



Ribe: The indoor temperature is buffered from the heat sink in the ground below (un-insulated concrete floor) <sup>6</sup>



Annual energy consumption:  $<2 \text{ kWh} / \text{m}^3$

Ribe: RH is stabilized by moisture buffering in materials

Mechanical dehumidification is necessary mainly in summer

Vejle (DK) storage facility (2004, new extension 2012)  
No windows, few doors





Inside the Vejle building: main store (50% RH)

Inside the Vejle building: main store (50% RH)



# Shared storage

## Aalborg



# Challenges: How do we use the collection in storage?

Marion F. Mecklenburg (Smithsonian) warns in his 2004 article *'Determining the Acceptable'*, that

*'...below the 12°C is the danger zone because further cooling approaches the glass transition temperature of acrylic emulsion paints'*

Conservators warn, that *cooling may result in failure of the adhesion of lined paintings by modern materials such as Plextol and Beva film*

In cool storage facilities we must therefore require an exceptional careful handling including limitations to any shock or vibrations to objects including polymers

# Challenges: How do we use the collection in storage?

A new '*Netherlands Collection Centre*' (CC NL) is to be built in Amersfoort, in the heart of the Netherlands.

With a total surface area of 30,000 m<sup>2</sup>, the building will house 675,000 objects, and is expected to be ready 2020

A low limit of 14<sup>0</sup>C is set and the store is further designed to allow short raising of floor temperature to accommodate the study of the collection by curators to develop exhibitions

# Challenges: How do we use the collection in storage?



François Bunel the Younger (attr. to), *The Confiscation of the Contents of a Painter's Studio*, c. 1590?  
Mauritshuis, The Hague, inv.no. Mh 875

Museum lending policies often require exorbitant strict environmental regimes – but if temperatures in storage and during transit stay above the 14°C limit, *why do we stick to a 24-hour acclimatisation time upon arrival?*

# Challenges: How do we use the collection in storage?

**MOWA**

Museum of Wisconsin Art



## Acknowledgements:

*Morten Ryhl-Svendsen*

*Bart Ankersmit*

*Tom Learner*

*Marion F. Mecklenburg*

## Select literature:

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