



What's the **Concept**

- Heating in winter (emitter), cooling in summer (absorber)
- Radiant cooling supplements airside system
- Can usually provide full heating
- Cooling medium warm 16°C to 22°C (61°F to 72°F)
- Heating medium cool at 30°C to 40°C (86°F to 104°F)
- Well suited to alternative energy sources due to moderate temperatures.

What's the **Attraction**

Common Perceived Shortcomings

- Cooling power limited – 40 W/m²
- Sensible cooling only
- No humidity control
- Slow time response
- Doesn't like carpet

What's the **Attraction**

- Aesthetic benefits – clean space
- Better acoustics
- Better comfort
- Facilitates decoupling cooling and ventilation
- Works well with Displacement or UFAD

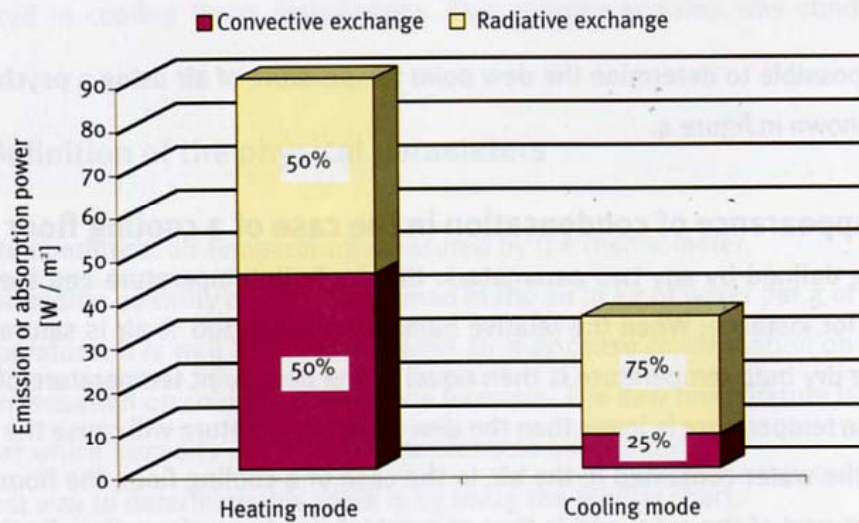
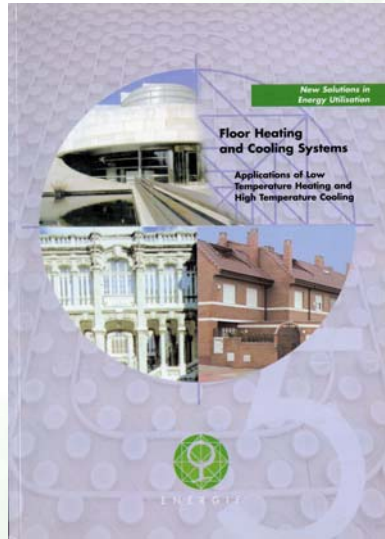
What's the **Attraction**

Improved plant efficiency

- Off peak
- Cascade loads
- Geothermal and aquifer cooling
- Evaporative cooled
- Can reduce construction time/cost

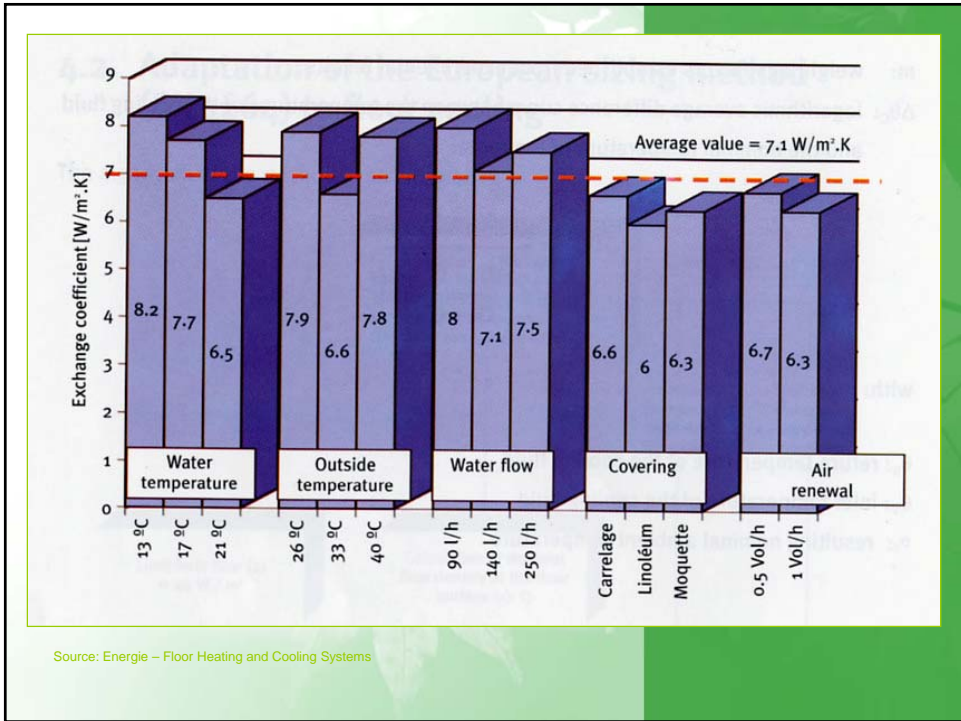
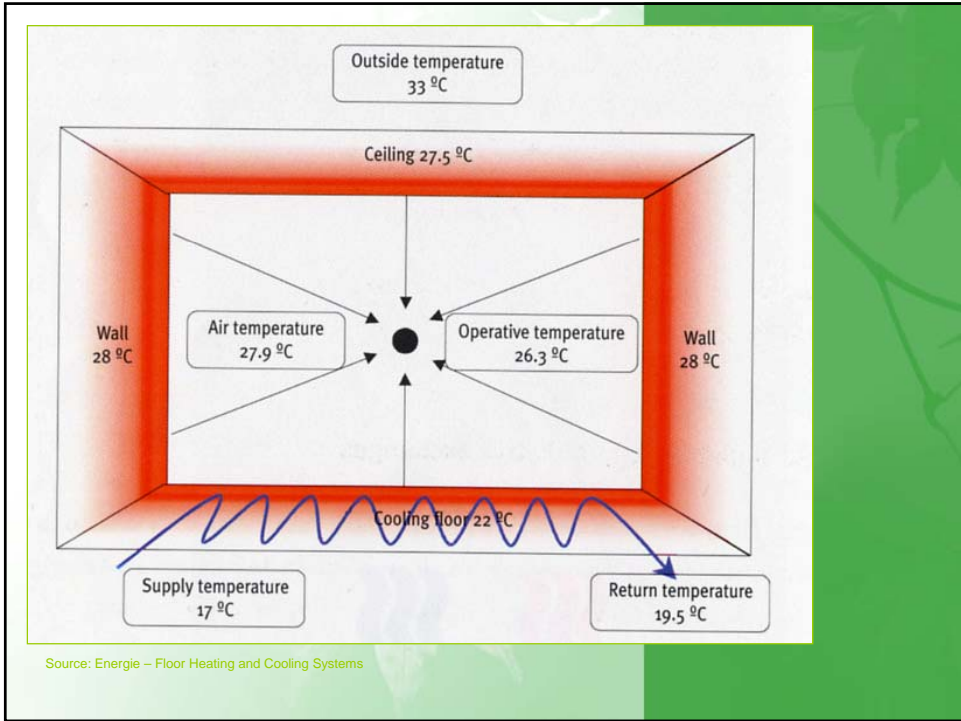
What's the **Attraction**

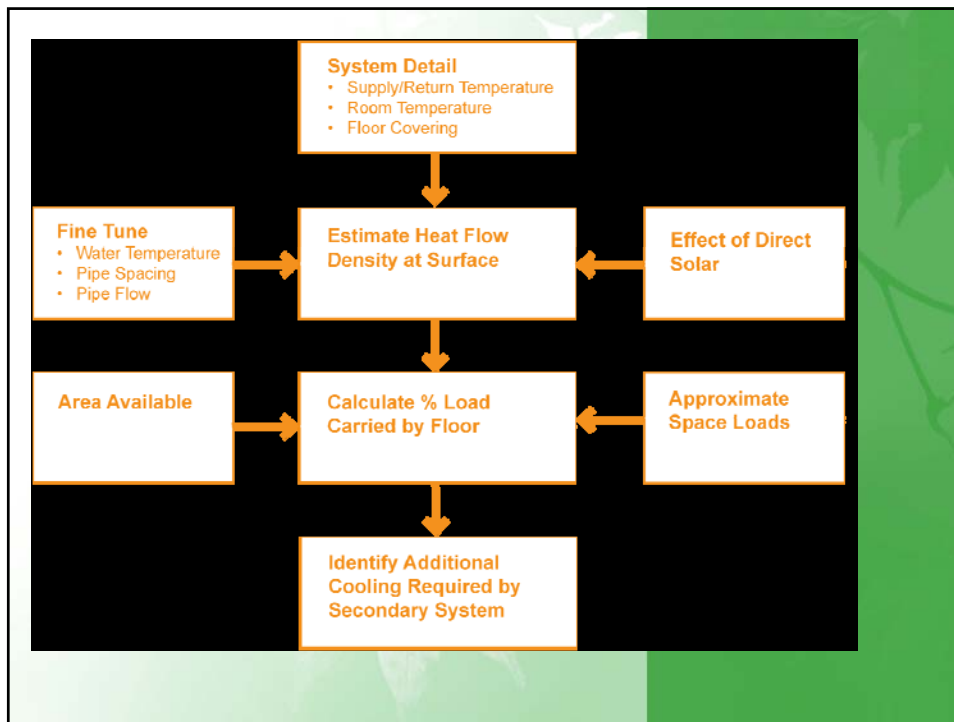
- Simplified controls
- Reacts to direct solar loads
- Fits well with Thermally Active Buildings and Green Buildings



Source: Energie – Floor Heating and Cooling Systems

- In direct sun - solar cooling can reach 100 to 150 W/m²





Keys to Conceptual Design Success

- Be at the table with the Architect from Day 1
- Low to moderate cooling loads
- High performance envelope – well sealed, controlled solar
- Decoupled ventilation concept
- High thermal mass
- Adaptive environmental conditions
- Good design data (Europe?)