

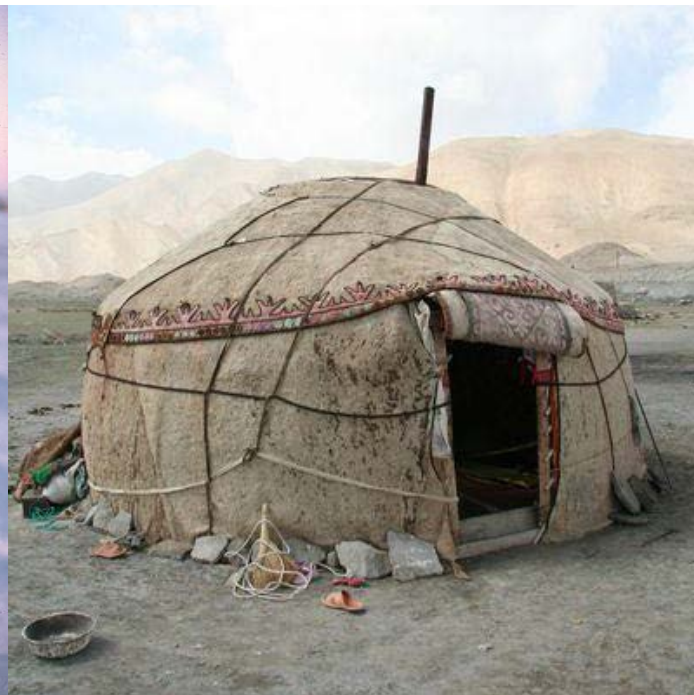
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# Advanced façade solutions

Towards energy efficient building skins

# A third skin that protects and provides comfort

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# A third skin that shows cultural and aesthetic values

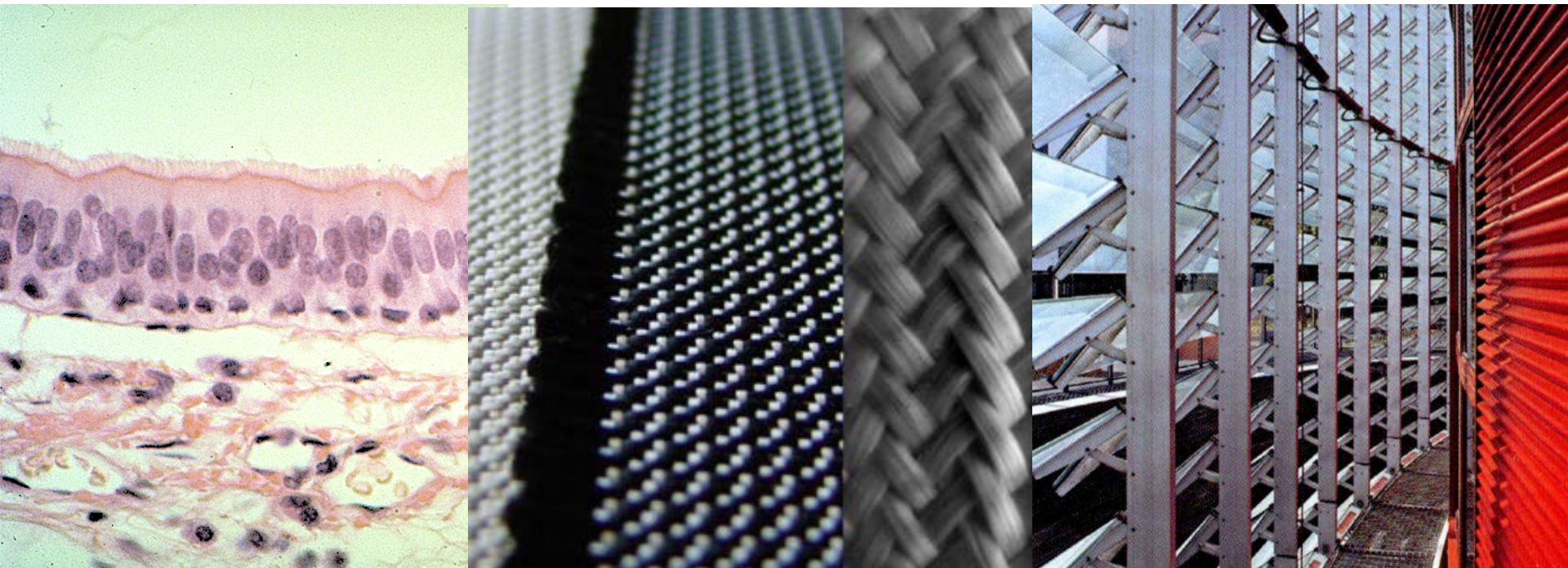
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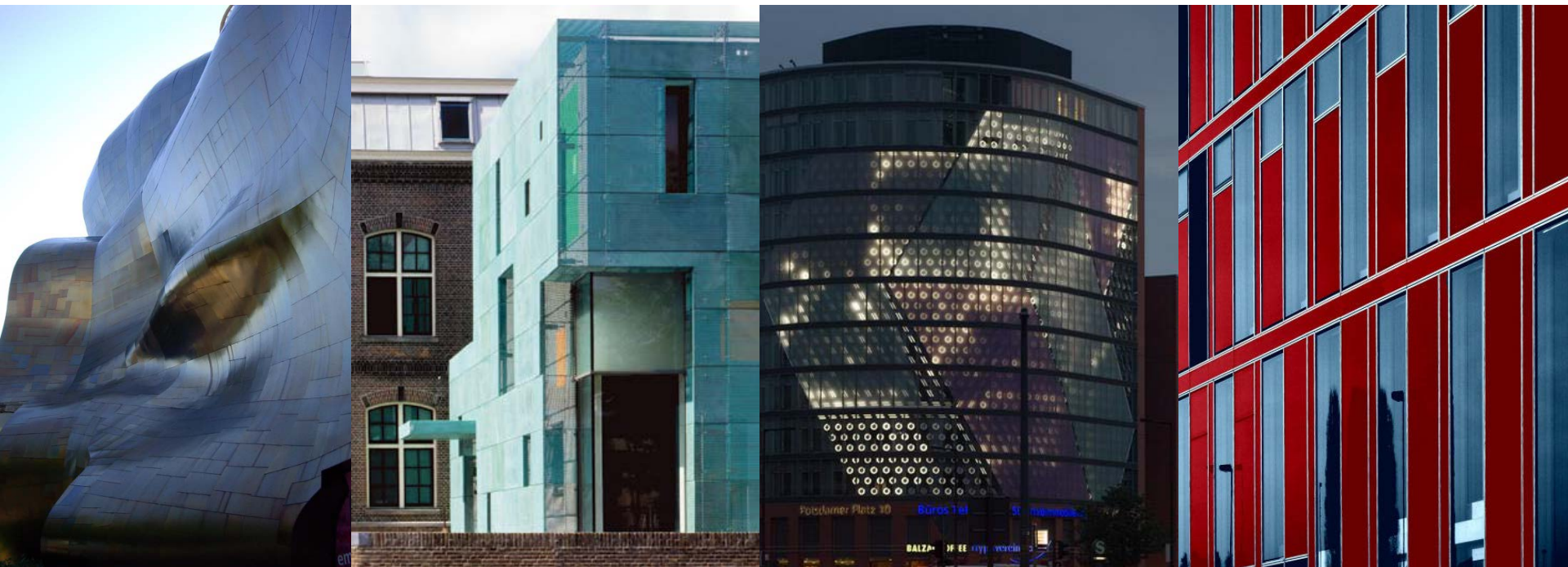
# A third skin that needs technologies and strategies

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# Advanced façades can have different appearances

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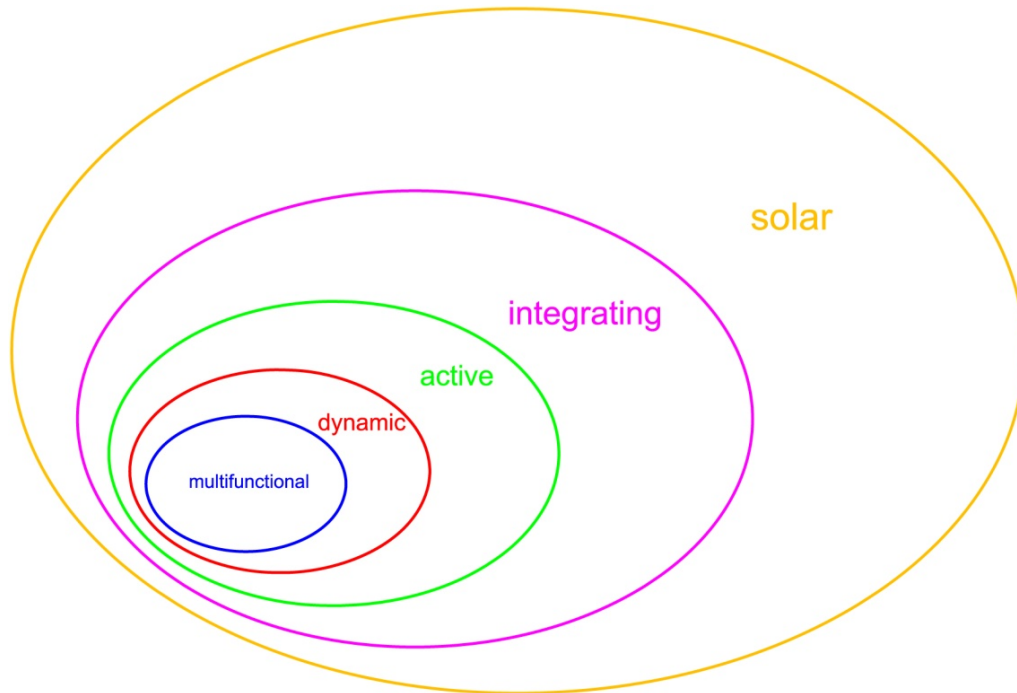
# Advanced façades can have different meanings

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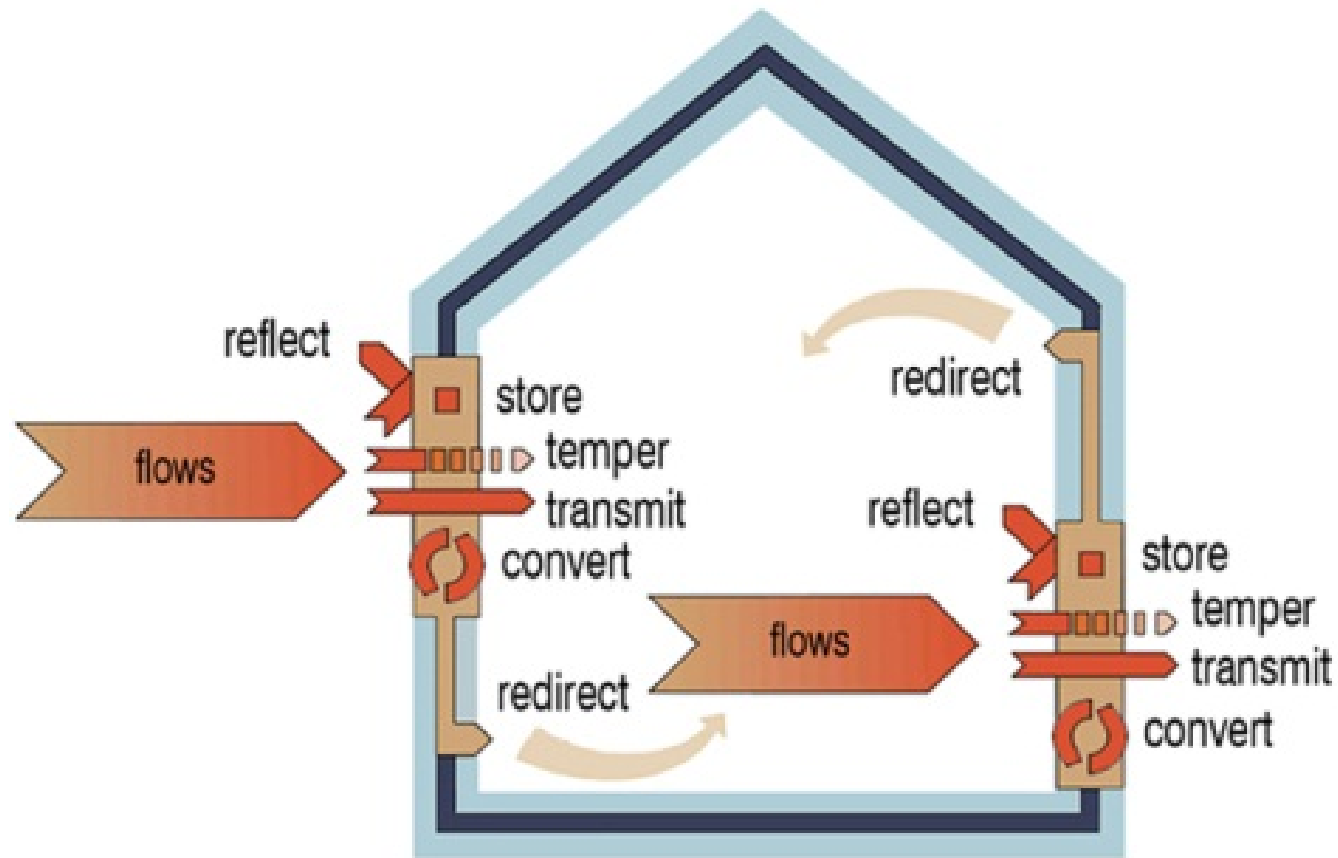
# Features and challenges of future façades

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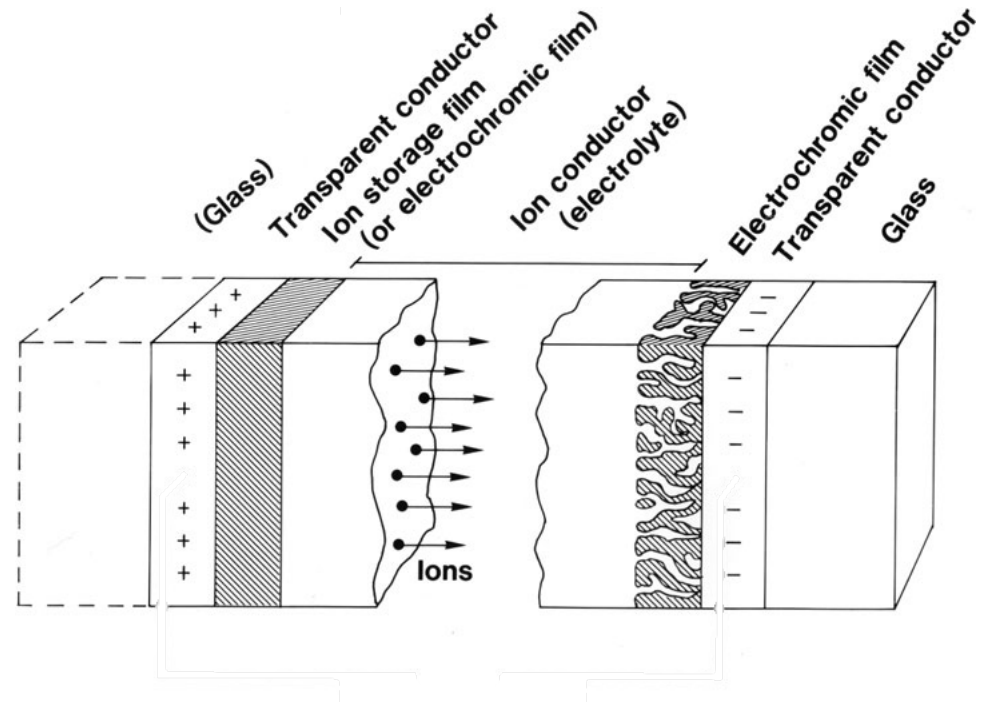
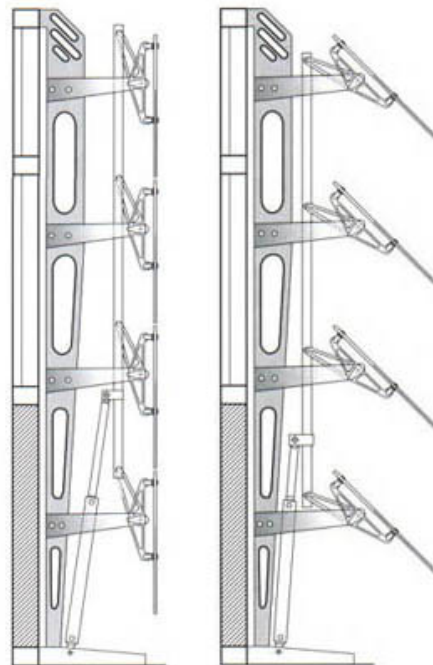
1. multifunctional
2. dynamic
3. active
4. integrating/ed
5. solar

# 1. Multifunctional



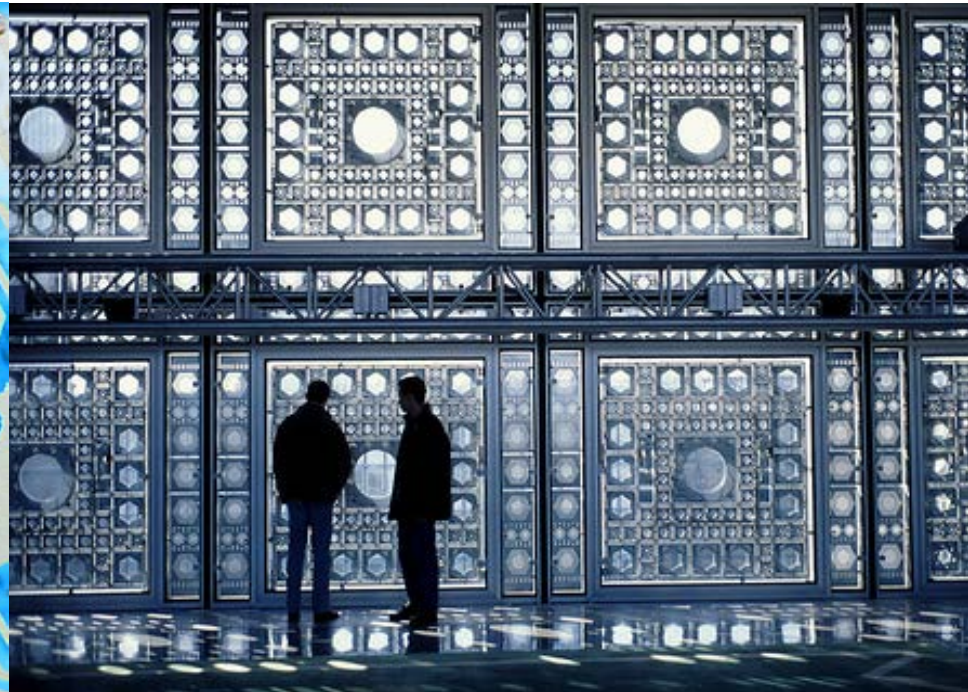
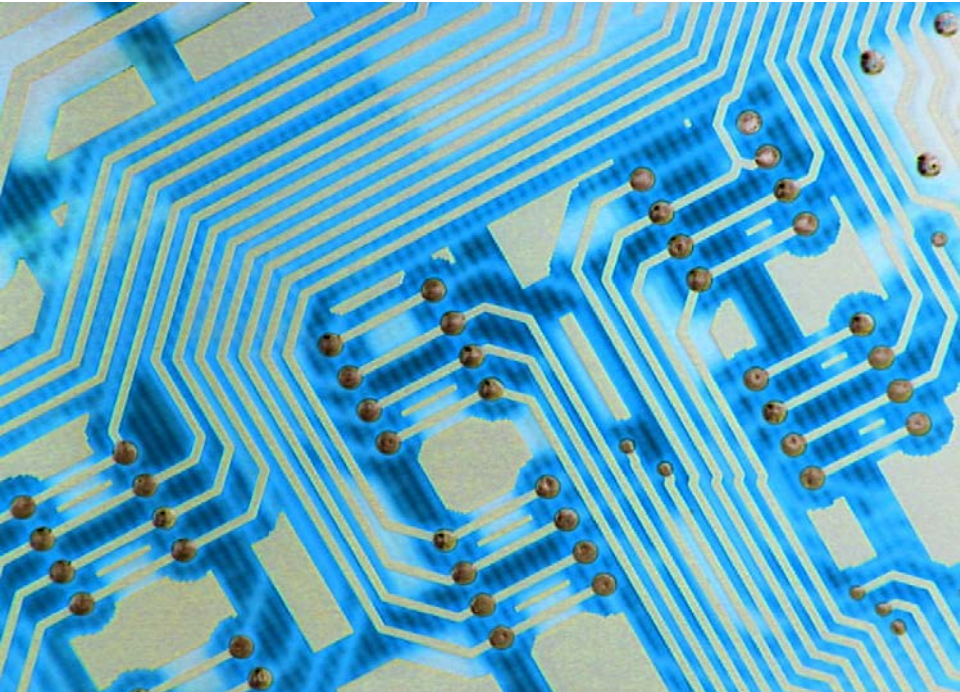


## 2. Dynamic



### 3. Active

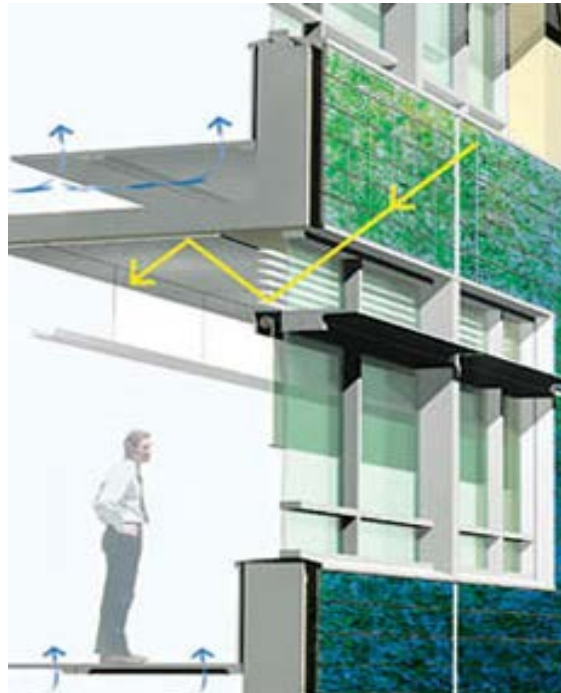
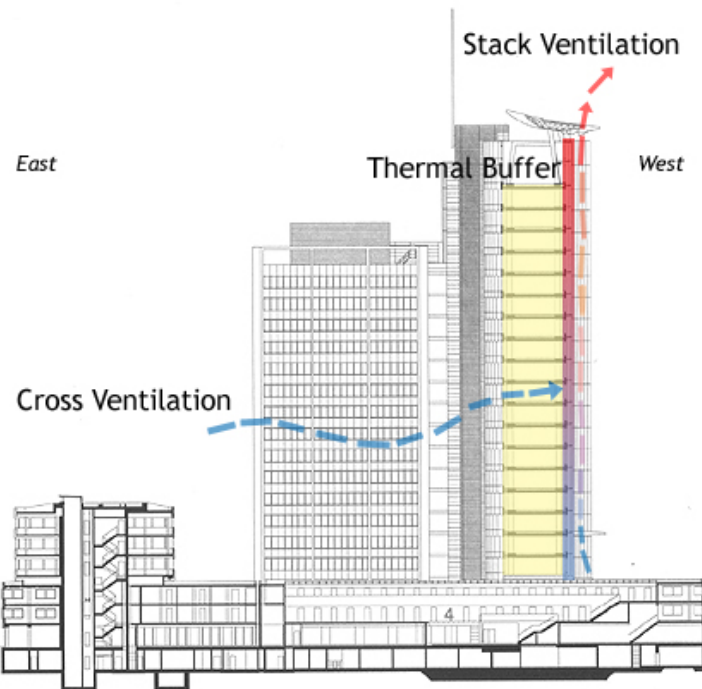
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# 4. Integrating/integrated

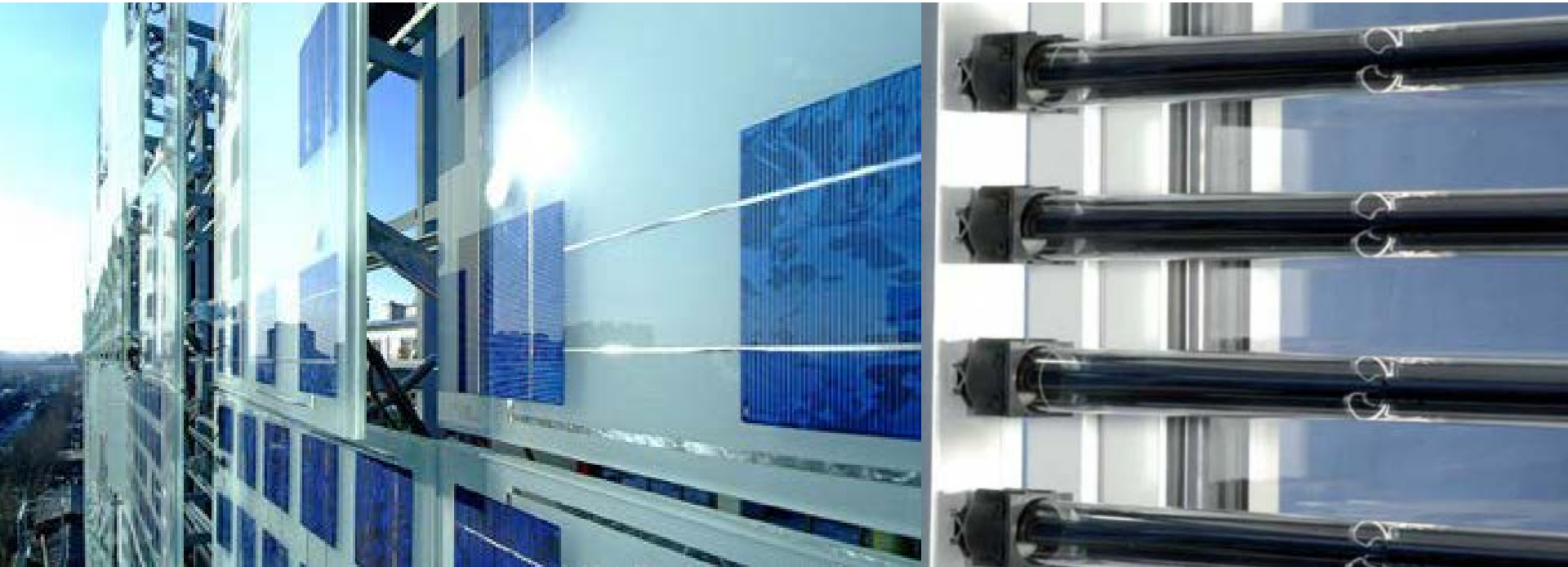
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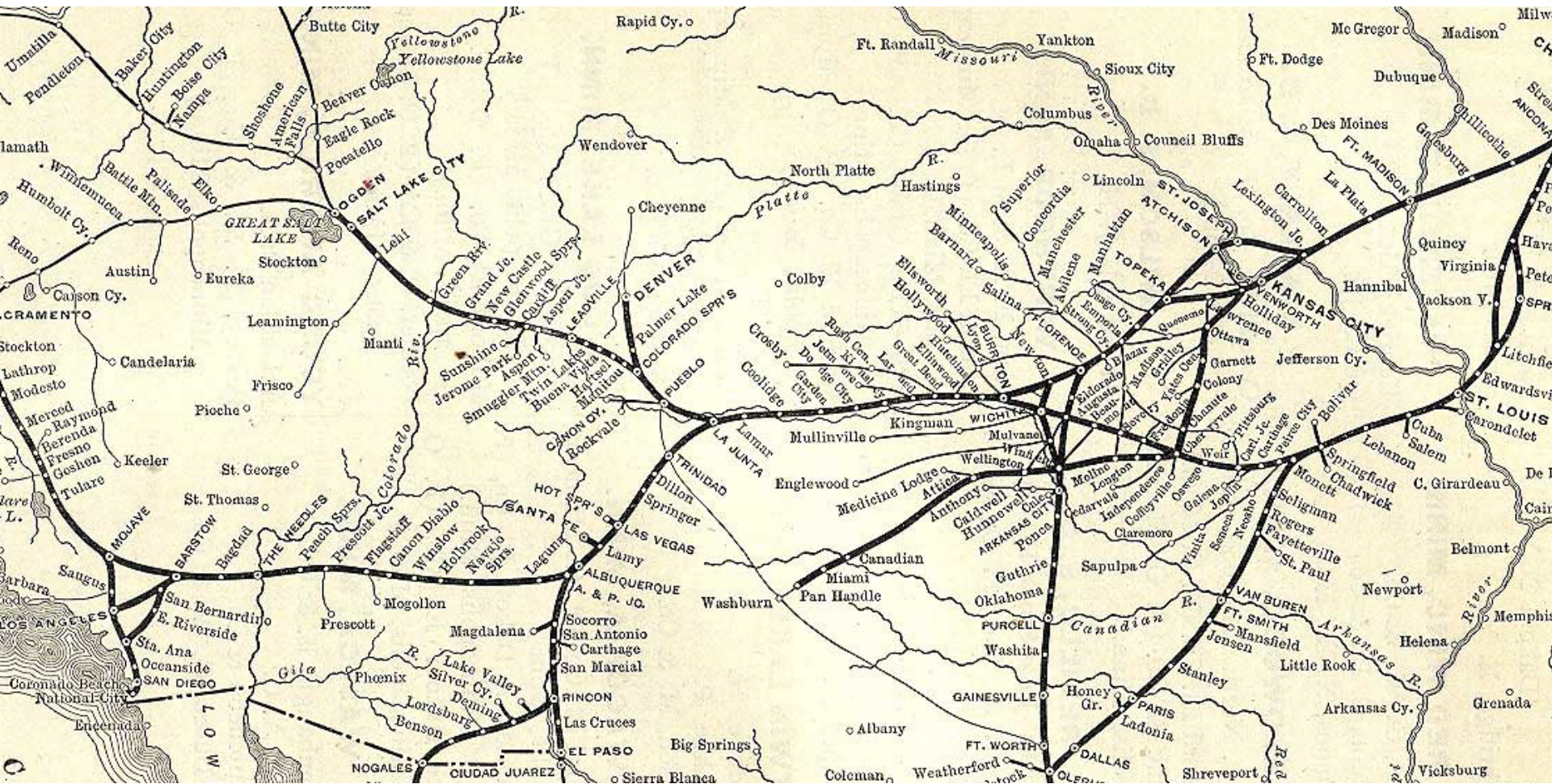


## 5. Solar

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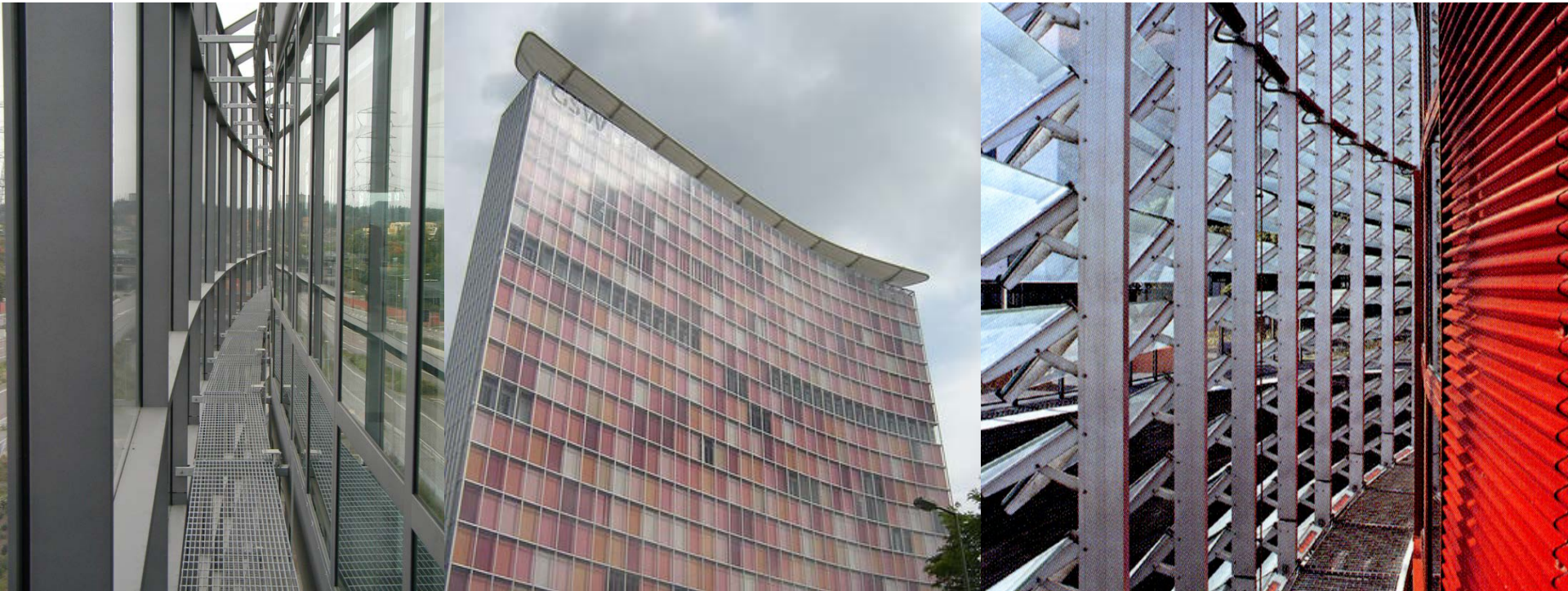
# Where are we now? Where are we going?





# Double skin façades

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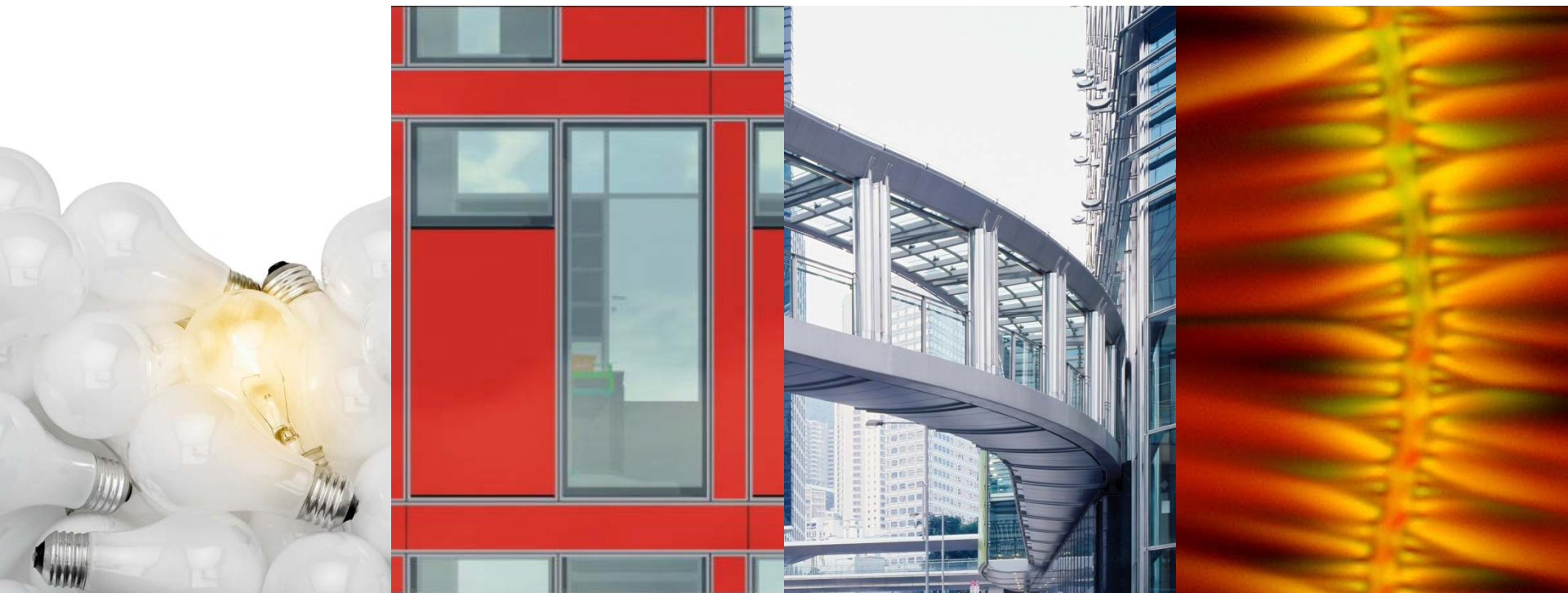
# Double skin façades

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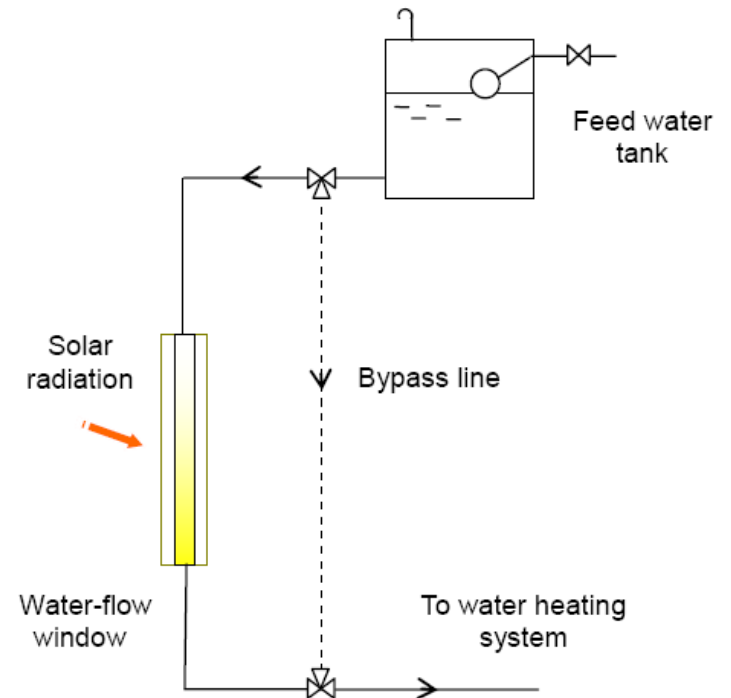
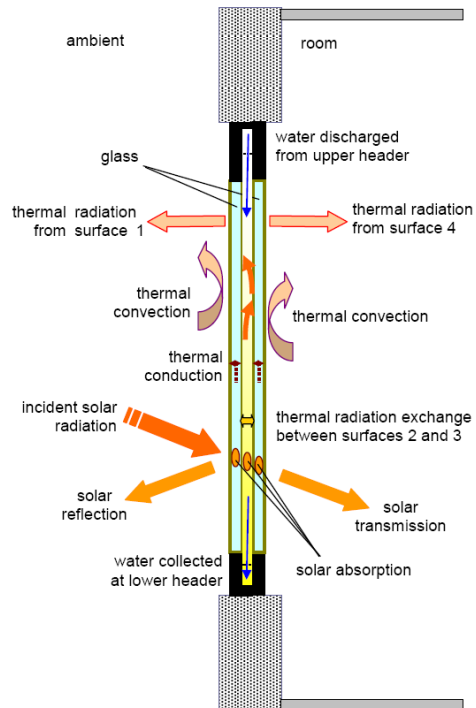
# New concepts/systems and technologies/materials

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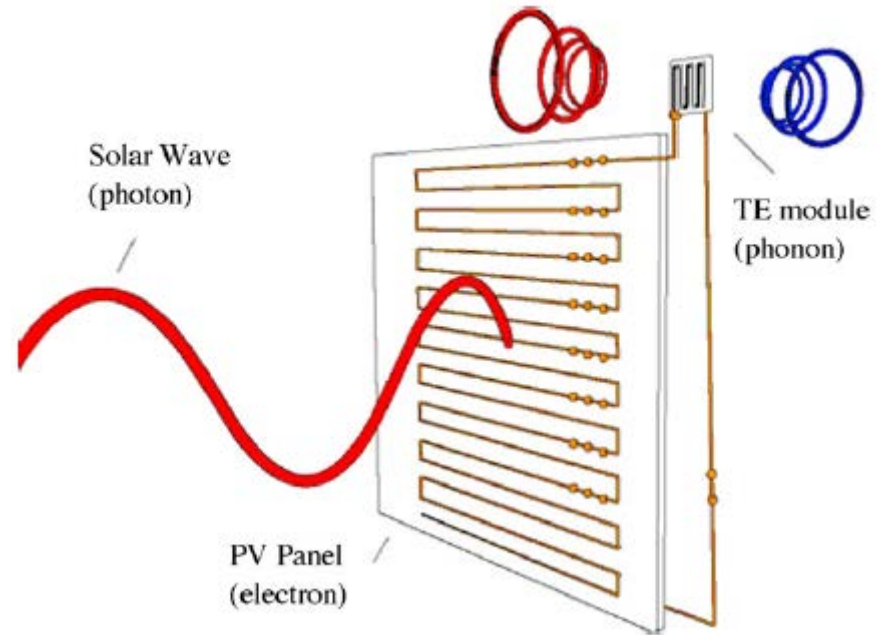
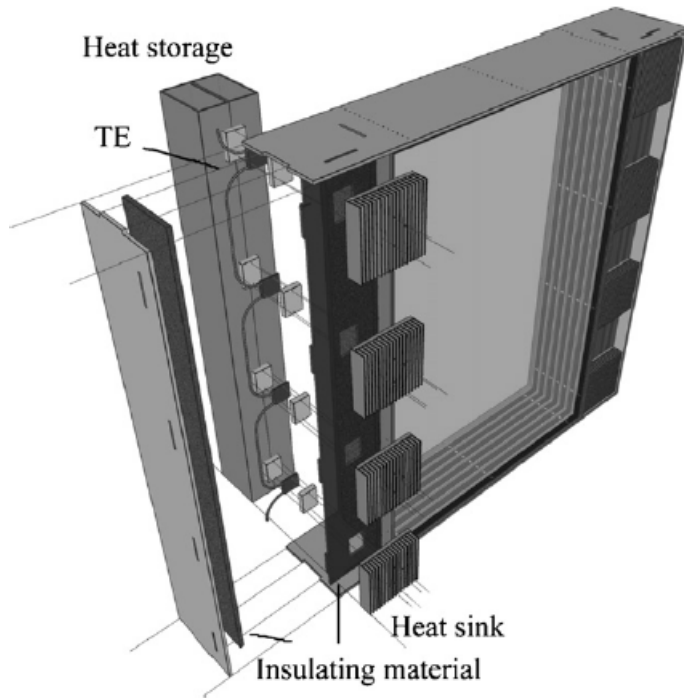
# A flavour of innovative solutions: systems



*“Liquid” solar windows*

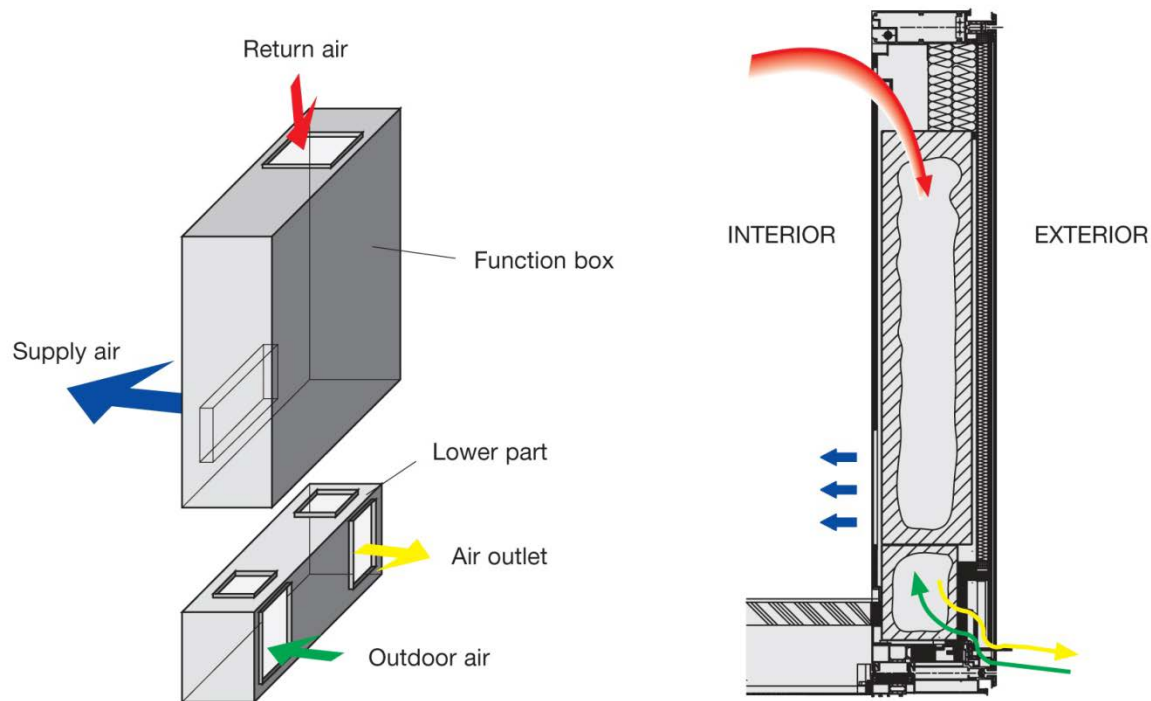


# A flavour of innovative solutions: systems



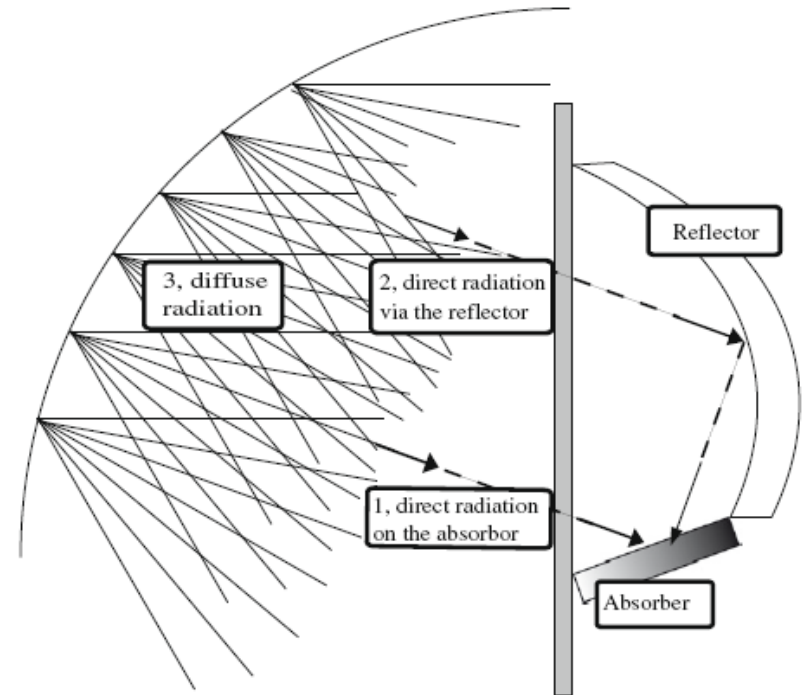
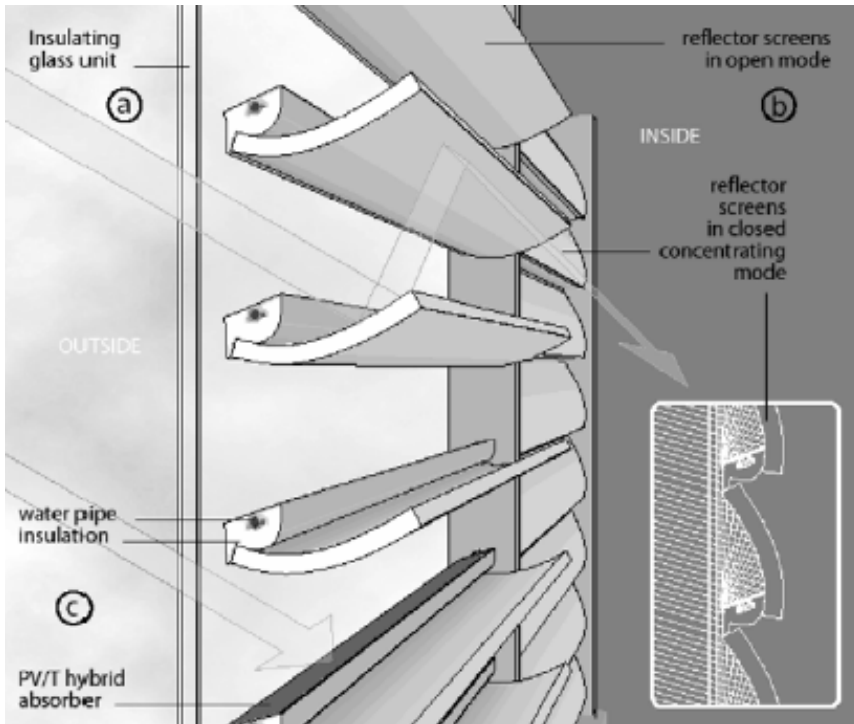
*“Active” PV-TE windows*

# A flavour of innovative solutions: systems



*Decentralized ventilation (and HVAC) units*

# A flavour of innovative solutions: systems

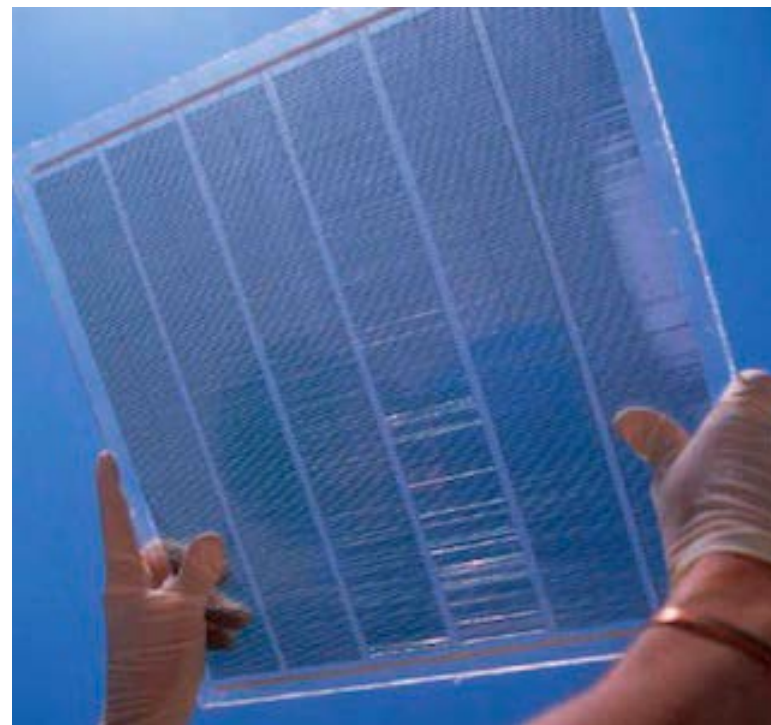


*Integrated PV-T shading*



# A flavour of innovative solutions: materials

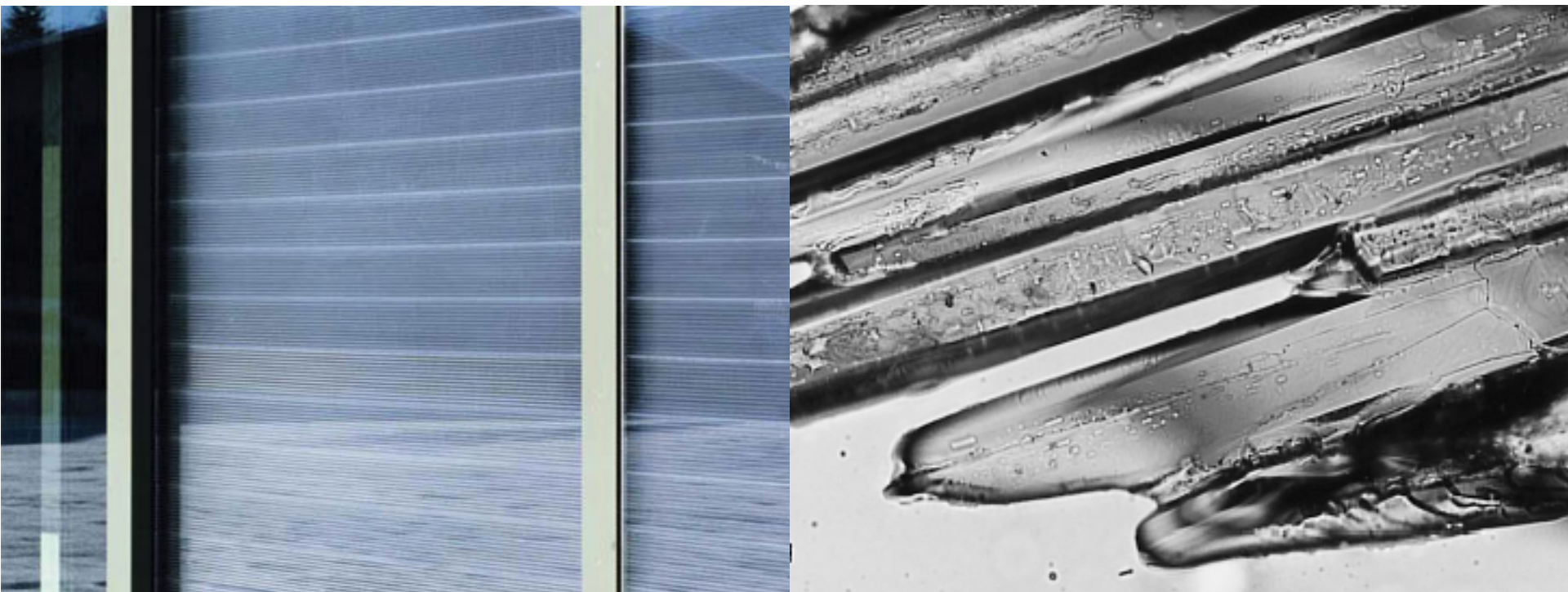
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*Thin and (semi)transparent PV systems*

# A flavour of innovative solutions: materials

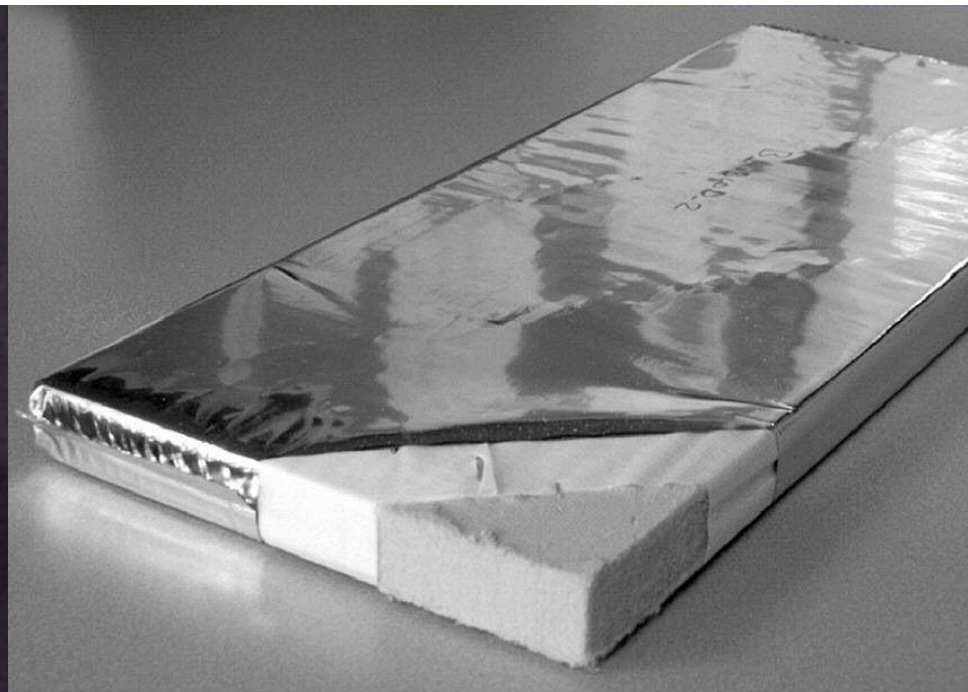
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*Phase Change Materials (in opaque and transparent components)*

# A flavour of innovative solutions: materials

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## *Aerogel and Vacuum Insulation Panels*



# A flavour of innovative solutions: materials

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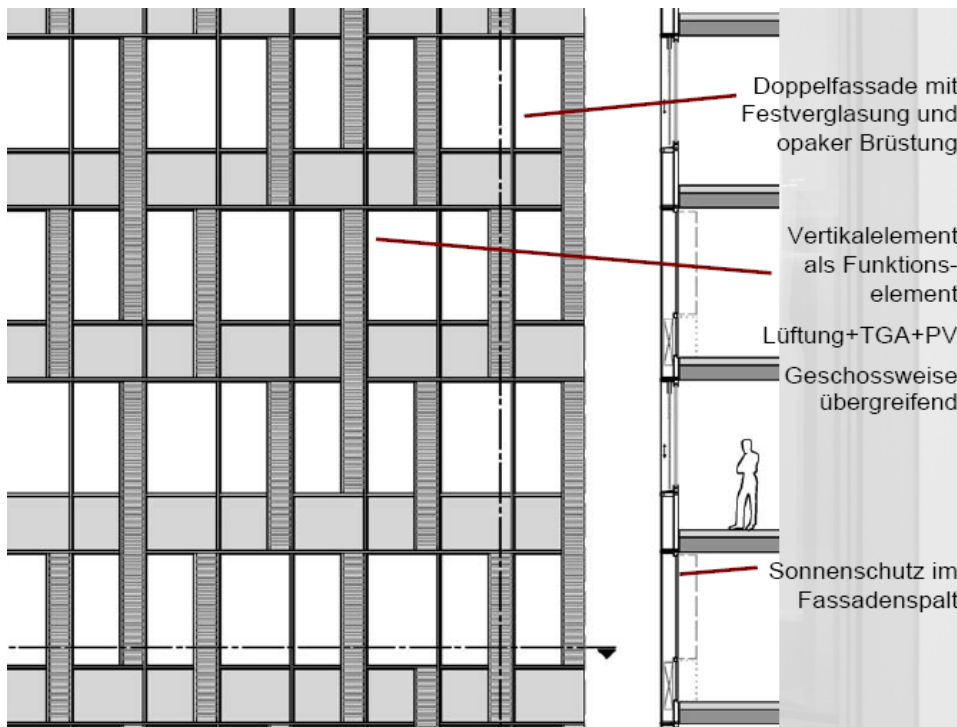


*Smart windows: electrochromic and thermotropic glass panes*

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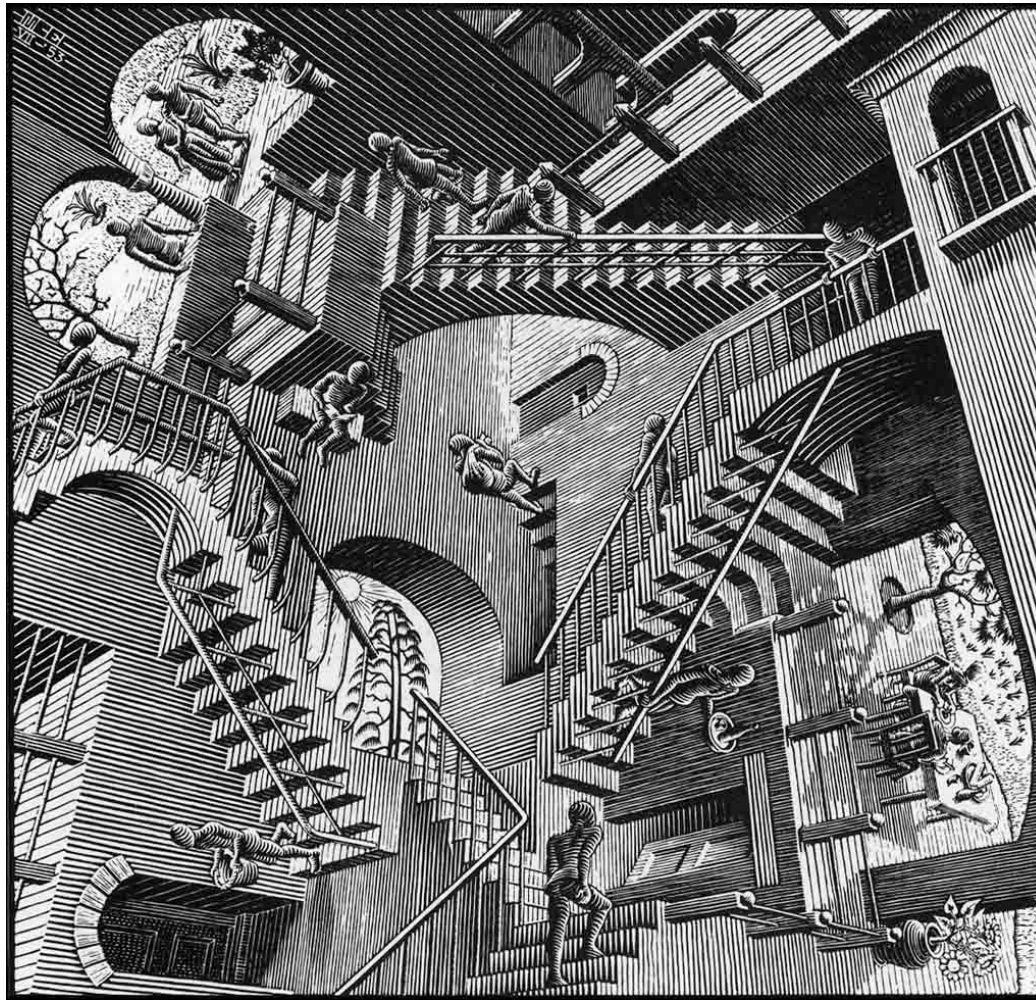


# Integrations of components: façade modules



*Wicona – TEmotion*

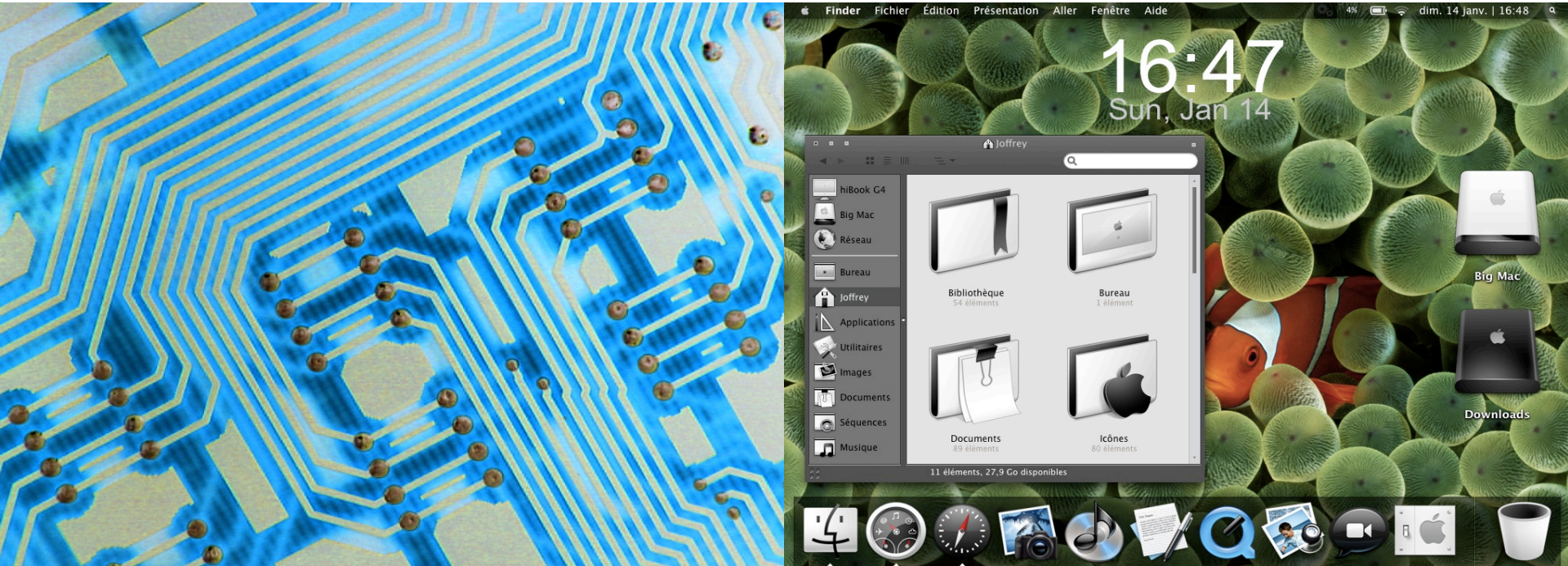
# Towards complexity: is it the right way?





# Managing complexity: functionality vs. usability technologies

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# Thanks for your attention

[francesco.goia@ntnu.no](mailto:francesco.goia@ntnu.no)

[francesco.goia@polito.it](mailto:francesco.goia@polito.it)