Daylight Simulation: Purpose and Path
Shrikar Bhave | Transsolar | Radiance Workshop 2013 | NREL
Agenda

Who we are?
Integrated design
Approach
Daylighting case-studies
Questions
Who We Are?
Offices

Stuttgart

New York

Munich

Paris
Who We Are?
GADGETS
DELIGHT
Approach

Can it work?

Does it work?

Can it work better?

Work = meeting the defined goals
Daylighting case-studies
Can it work?

Image Credit: Thomas Phifer and Partners
Daylighting case-studies
Can it work?

- Reflect morning daylight
- Block direct sunlight
- Filter harsh daylight

Morning
Noon
Afternoon
Daylighting case-studies
Can it work?
Daylighting case-studies
Can it work?
Daylighting case-studies
Can it work?
Daylighting case-studies
Does it work?

Image Credit: Studio Gang Architects
Daylighting case-studies

Does it work?

Image Credit: Studio Gang Architects
Daylighting case-studies

Does it work?
Daylighting case-studies
Does it work?
Daylighting case-studies

Can it work better?
Daylighting case-studies
Can it work better?
Daylighting case-studies

Can it work better?

![Shading concept diagram with annotations](image)
## Daylighting case-studies

**Can it work better?**

<table>
<thead>
<tr>
<th>Daily Solar Insolation (kWh/m²)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summer Solstice (June 21)</strong></td>
<td></td>
</tr>
<tr>
<td>Projection Factor</td>
<td>0, 0.6, 1.0, 1.7</td>
</tr>
<tr>
<td>Target Value Max 1.3 kWh/m²</td>
<td></td>
</tr>
<tr>
<td><strong>Equinox (September 21)</strong></td>
<td></td>
</tr>
<tr>
<td>Projection Factor</td>
<td>0, 0.6, 1.0, 1.7</td>
</tr>
<tr>
<td>Target Value Max 1.3 kWh/m²</td>
<td></td>
</tr>
<tr>
<td><strong>Winter Solstice (December 21)</strong></td>
<td></td>
</tr>
<tr>
<td>Projection Factor</td>
<td>0, 0.6, 1.0, 1.7</td>
</tr>
<tr>
<td>Target Value Max 1.3 kWh/m²</td>
<td></td>
</tr>
</tbody>
</table>

- **d** and **h** represent dimensions in the diagram.
Daylighting case-studies
Can it work better?
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Daylighting case-studies
Can it work better?

Image Credit: Behnisch Architekten
Daylighting case-studies

No Direct Sun-penetration

Daylight < 750lux/500lux
Daylighting case-studies
Daylighting case-studies
Daylighting case-studies

Visible transmittance: 72% and 54%

Time: 09:00

Day 03/21

Day 06/21

Day 12/21
Daylighting case-studies
Daylighting case-studies
Future Developments

Rhino + Grasshopper + DIVA + VIPER + TRNSYS
Future Developments
Future Developments
Tht light just blew my mind. Its unreal.
Without computers... No blue prints.
You are in rome???

Yep.. Got here yest.  

The last one is one of the most beautiful images I have seen.

Tht light just blew my mind. Its unreal.

Without computers.. No blue prints.

I know right
Thank You! Questions?