Daylight
The good, the bad and the ugly of light and energy

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MA Architectural Lighting Design • Wismar • Germany

1. Presentation

Paulina Pablo Ximena Rodrigo Paulo Pamela Stefano Mónica

Architectural Lighting Design
www.diav.cl

Architectural Renewable Energy Projects
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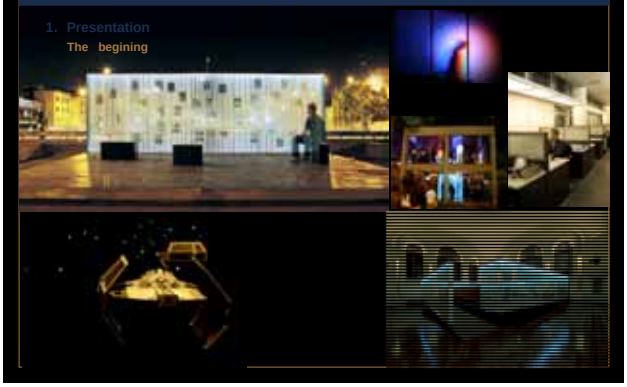
Lighting Design Products
www.theanemix.com

1. Presentation
The begining



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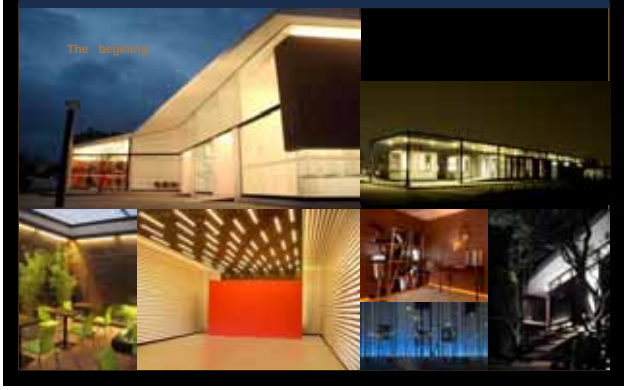

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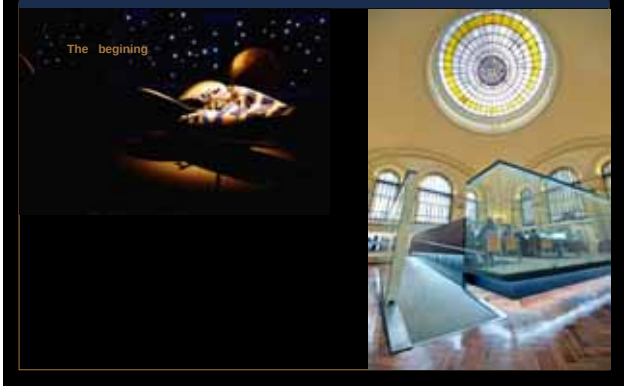

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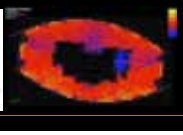

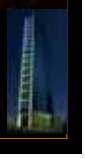

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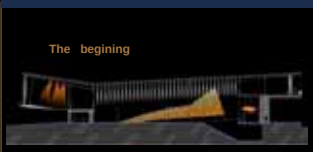


2. Case Study
   Shopping Centre in Chile

   The Lighting Assignment

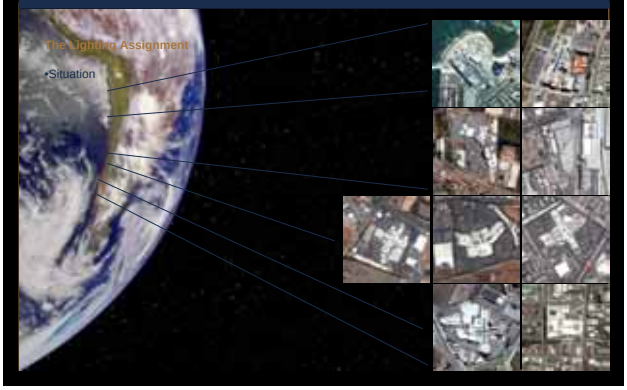
   •Situation
   •Evaluation
   •Propusals

Energy Crisis
Opportunity to think about light

Chile - high price of energy in America - the Continent

Light 30% - Clime 60%

Outdoor Lux
Solar Radiation
Architectural Copy-Paste
Lighting consequences



Sample Analysis

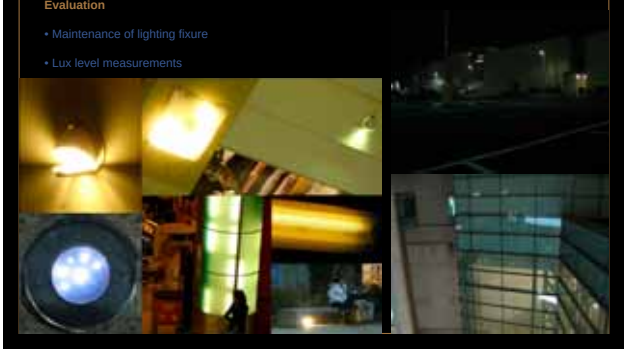
- Cadaster of lighting fixure per zone
  Plan vs Reality
- Cadaster of Night lux levels
- Cadaster of Daylight lux levels

Evaluation
Main problems

- Maintenance of lighting fixure
- Energy costs evaluation for upgrade technology, light quality & maintenenance
- Lux level measurements
- Color temperature measurment (perceptive)
- Lighting distrubution: zones day & night
- Exterior & interior Glare evaluation
- Landscape lighting layout
- Façade lighting layout

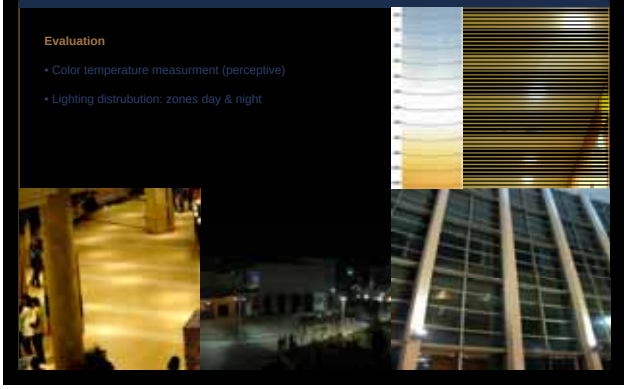
Evaluation

- Maintenance of lighting fixure
- Lux level measurements



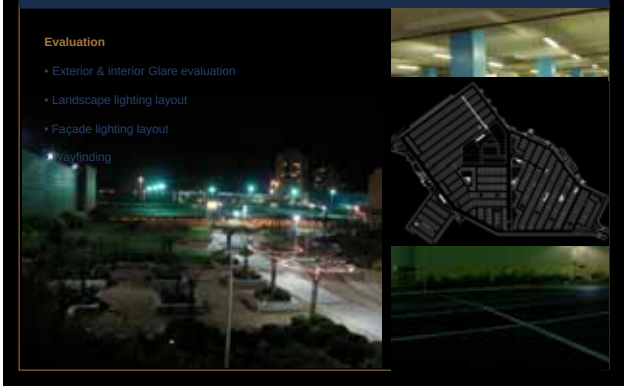
Evaluation

- Color temperature measurment (perceptive)
- Lighting distrubution: zones day & night



Evaluation

- Exterior & interior Glare evaluation
- Landscape lighting layout
- Façade lighting layout
- Wayfinding



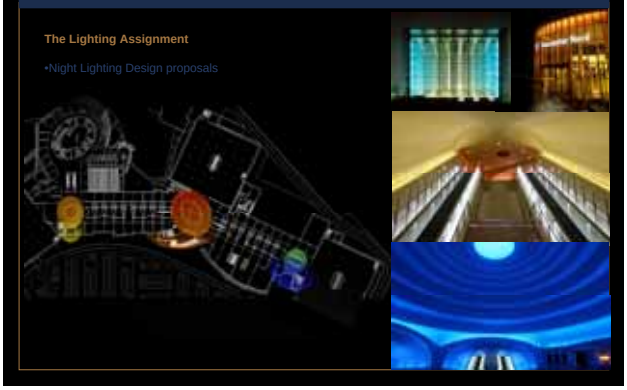
Evaluation On Off

The Lighting Assignment

•Daylight interior Proposals

The Lighting Assignment

•Night Lighting Design proposals



3. Daylight & Energy

Conclusions after Assignment

- •Situation
- •Evaluation
- •Possible Solutions

Lighting Design can be propose
Energy saving can be propose

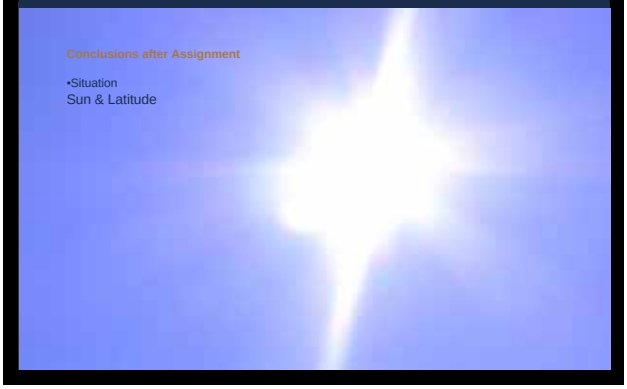
But a good solution involves
•Sunlight
•Architectural interventions

Latitude and Radiation
Architectural Shape references
Money & energy savings

Conclusions after Assignment

- •Situation

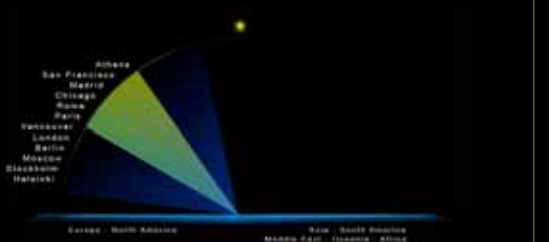
Sun & Latitude



Conclusions after Assignment

- •Situation

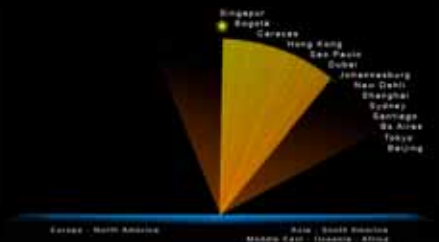
Sun & Latitude



Conclusions after Assignment

- •Situation

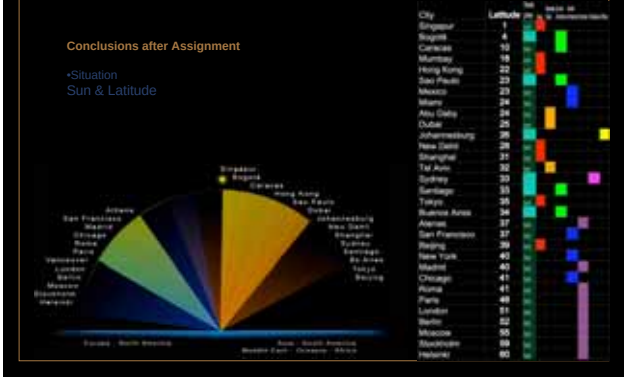
Sun & Latitude



Conclusions after Assignment

- •Situation

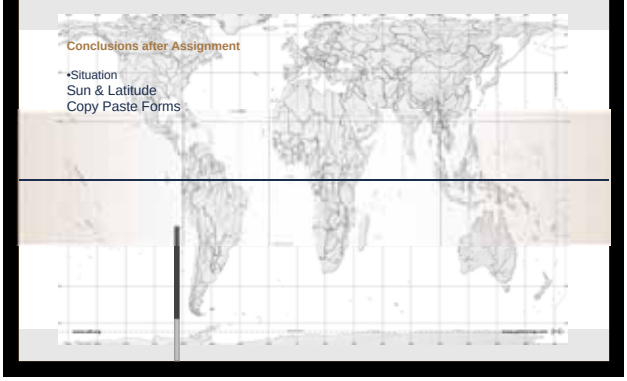
Sun & Latitude



Conclusions after Assignment

- •Situation

Sun & Latitude
Copy Paste Forms



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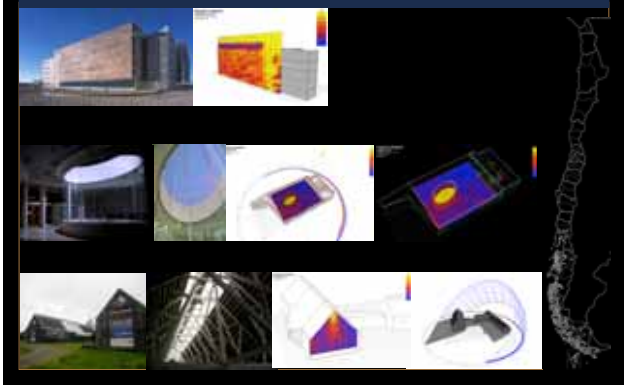

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Conclusions after Assignment

Sun & Latitude
- Lat 33º
- 28º C
- Summer **140.000** lux

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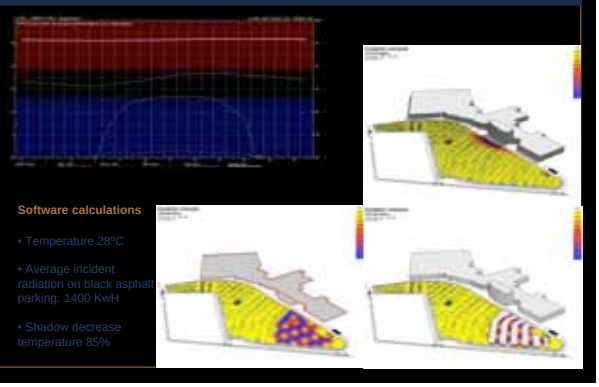

Software calculations

- Temperature 28ºC
- Average incident radiation on black asphalt parking: 1400 KwH
- Shadow decrease temperature 85%

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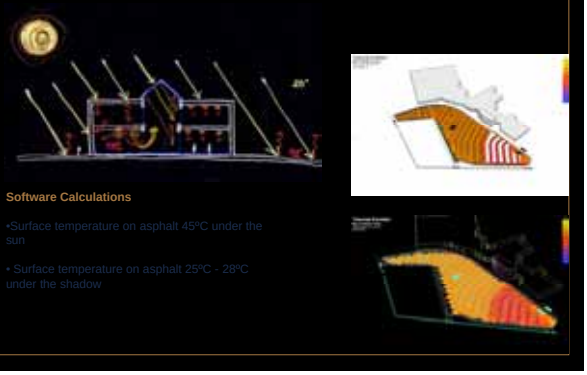

Software Calculations

- Surface temperature on asphalt 45ºC under the sun
- Surface temperature on asphalt 25ºC - 28ºC under the shadow

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Measurements on site

- Outdoor Lux 82.000
- Outdoor temperature 24ºC
- Surface temperature on asphalt 61ºC under the sun
- Surface temperature on asphalt 18ºC under the shadow
- So, Why not in the Shopping Mall?

4. Conclusions

Crisis & Possibilities

Crisis
Provoke another point of view
- Improve traditional solutions
- Upgrade technology
- Incorporate design

Energy optimization is about
- Design
- Technology
- Common sense

Energy optimization is about

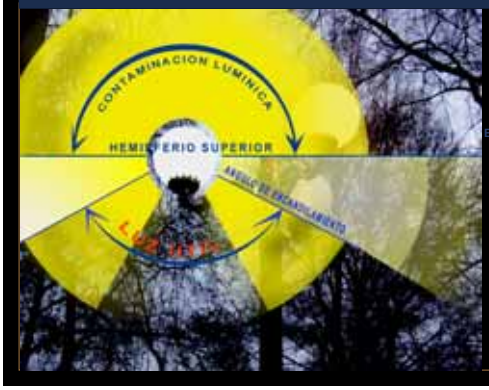
- Design
- Technology
- Common sense

In out door lighting

Light Pollution care is

- Astronomic
- Ecologic
- Economic

For out door lighting

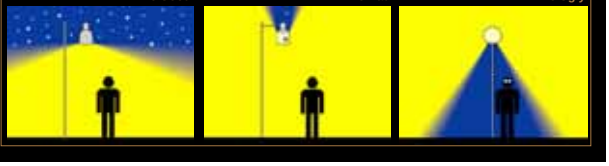


Energy optimization
Light Pollution

Exteriors
The rule of…

- Energy
- Glare (visual comfort)
- Light Pullotion

The Good **The Bad** **The Ugly**



Daylighting Design

- Energy
- Glare (visual comfort)
- Interior darknes / outside brightness

The Good **The Bad** **The Ugly**

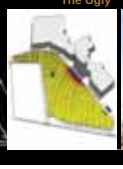
Daylighting Solar radiation

- Energy
- Overheating
- **Copy - Paste** Froms from another latitudes

The Good

The Bad

The Ugly



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Thank you