

The Green Parameter

verso un utilizzo della sostenibilità come parametro integrativo alla progettazione

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Dove vengono inseriti alcuni parametri nel processo progettuale oggi?

Come includere alcuni parametri fin dalle prime fasi progettuali?

Perché includere questi parametri?

Cosa vuol dire includere questi parametri oggi?

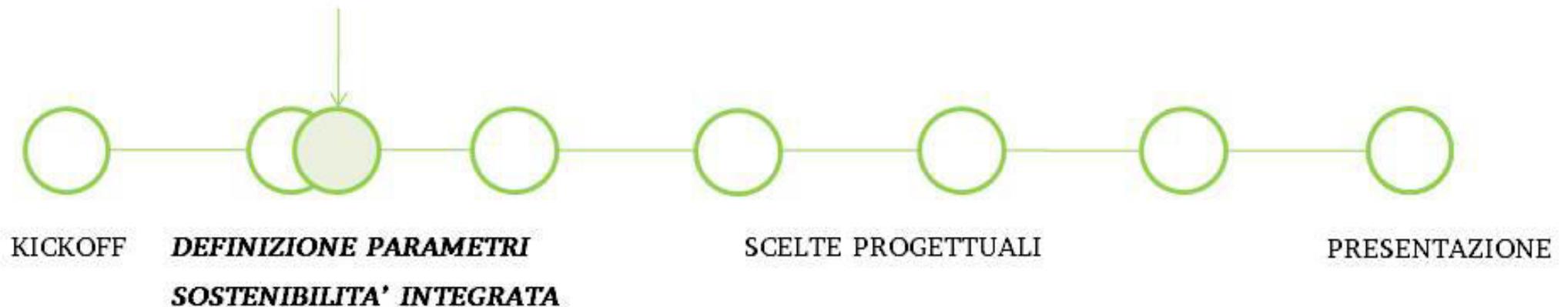
Approccio progettuale e sostenibilità a confronto: il ruolo dell'architettura.

The Green Parameter

PROCESSO PROGETTUALE: SOSTENIBILITA' COME ELEMENTO AGGIUNTO

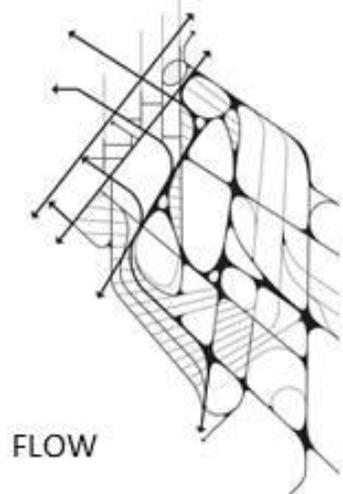


PROCESSO PROGETTUALE: SOSTENIBILITA' COME PARAMETRO INTEGRATO



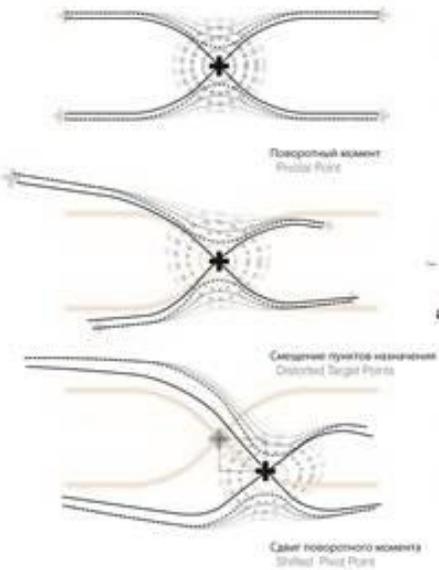
The Green Parameter

MAIN PARAMETERS FOR DESIGN

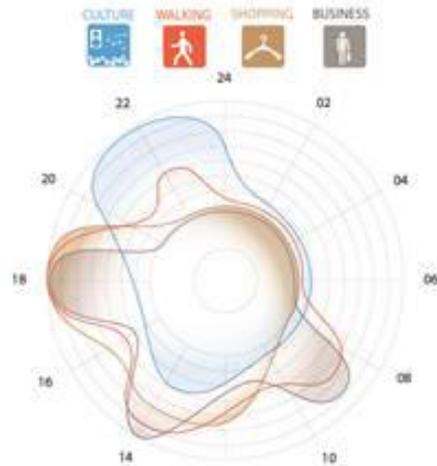


FLOW

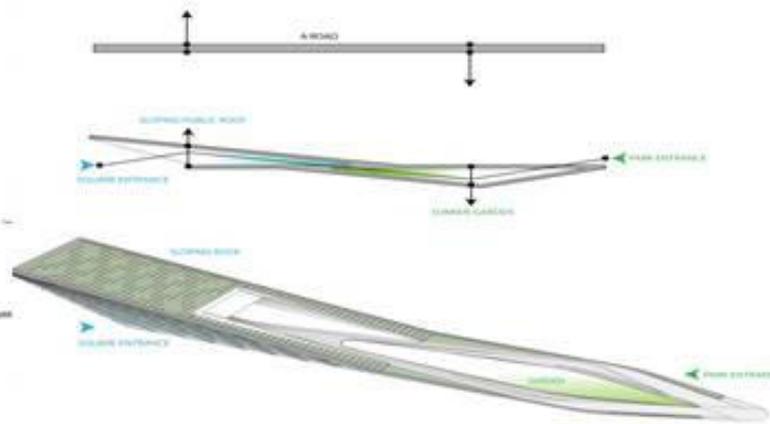
гибкая X-модель
FLEXIBLE X-TYPE



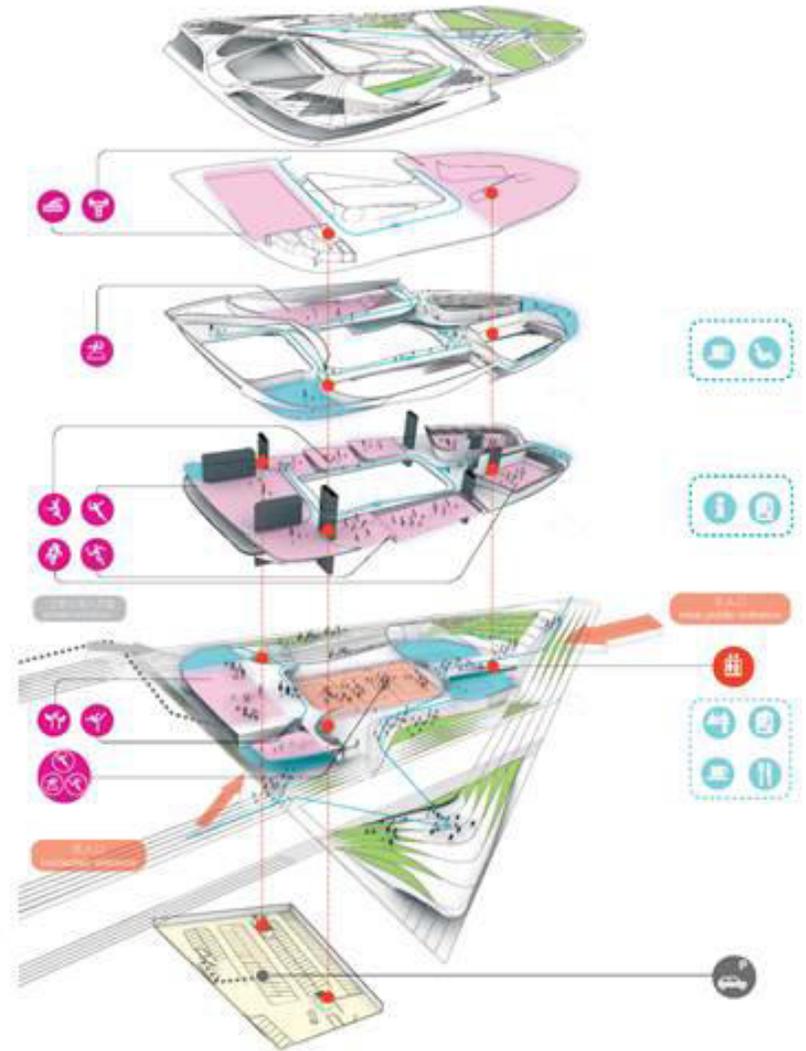
TPOLOGY



TIME



MASSING



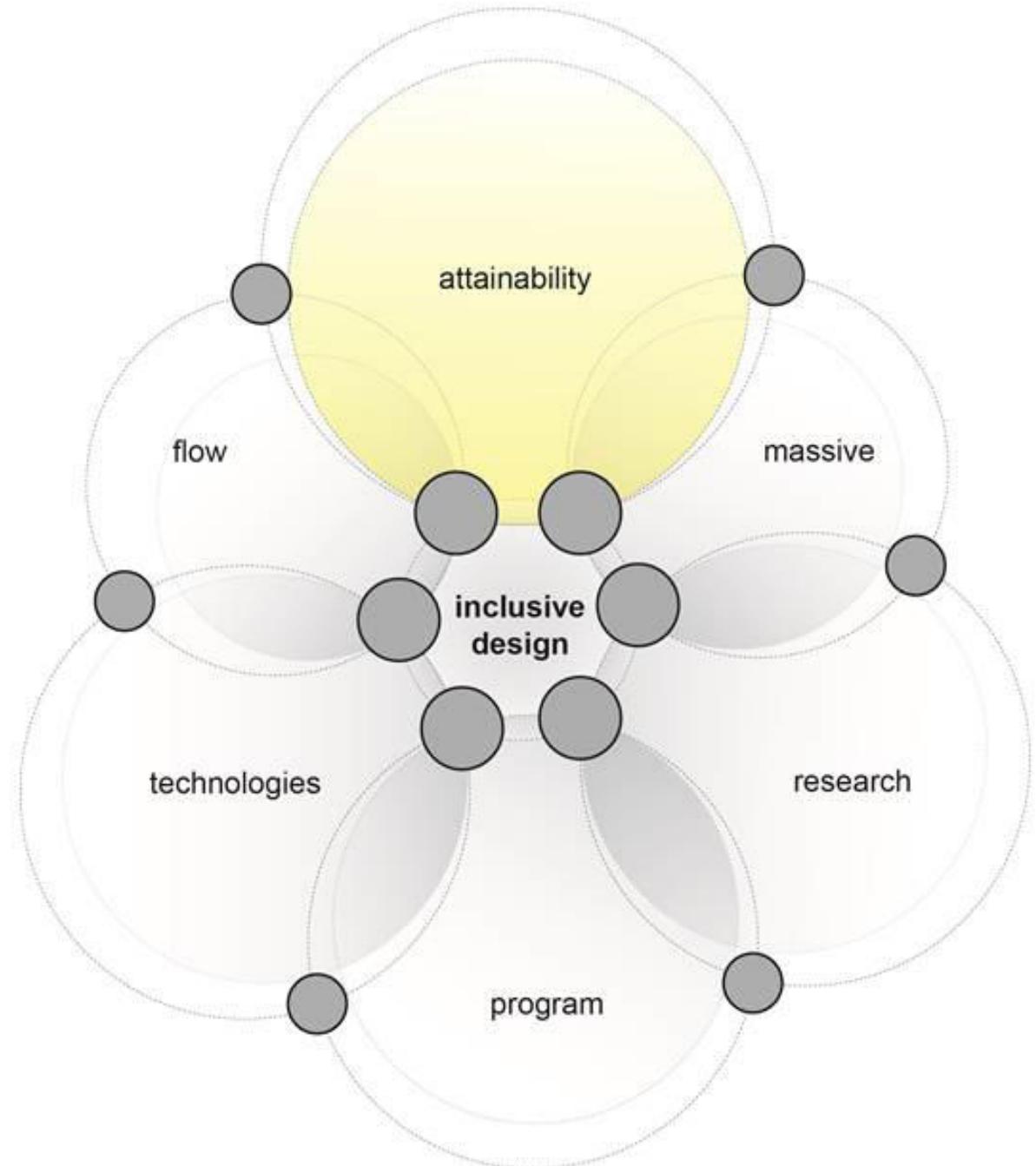
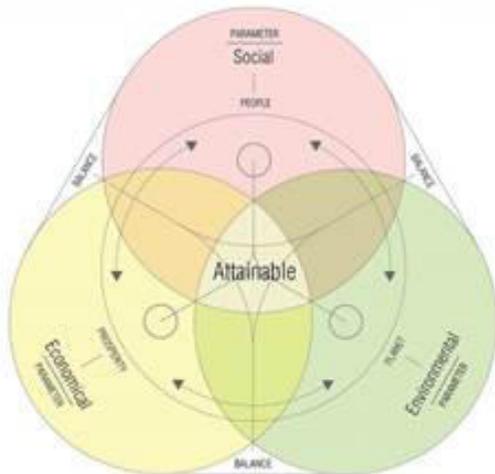
PROGRAM

The Green Parameter

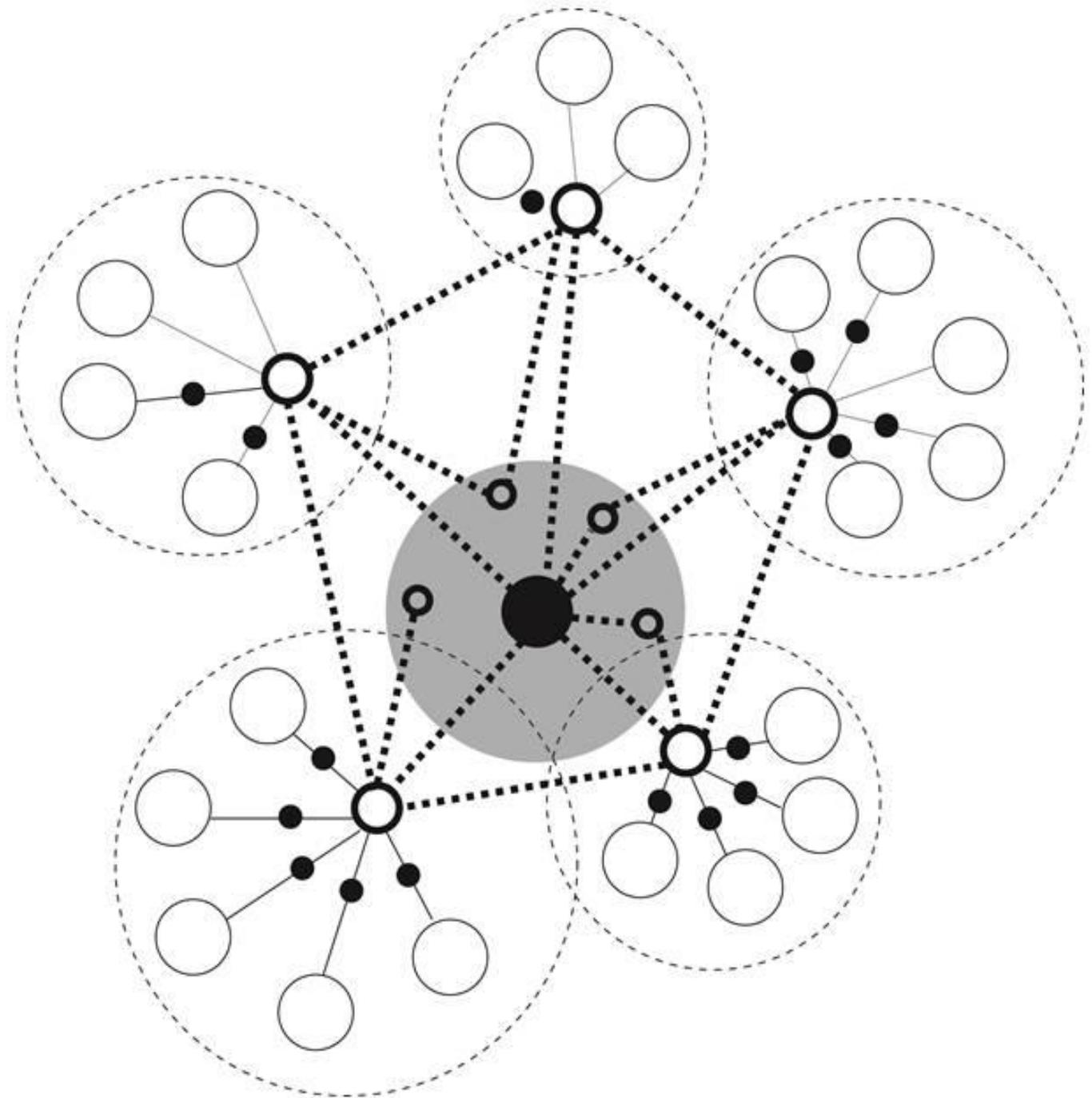
THE INCLUSIVE DESIGN

«inclusive design» unisce **integrazione e esclusività**.

La sostenibilità come punto di partenza di ogni progetto relazionandosi con il contesto, rappresenta per l'architetto elemento di unicità e esclusività del design.

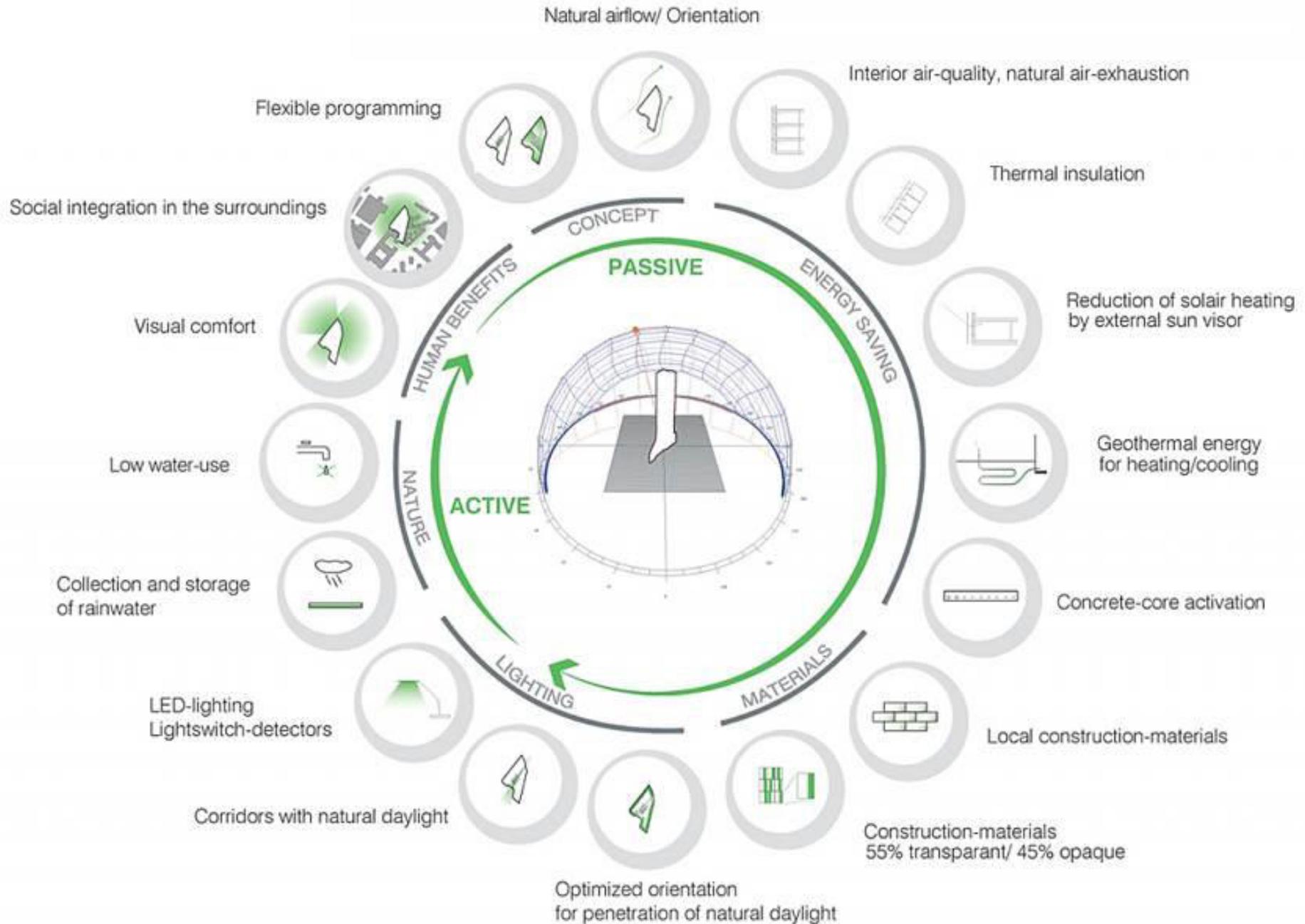


The Green Parameter



The Green Parameter

PASSIVE AND ACTIVE CIRCLE



The Green Parameter- Ponte Parodi, UNStudio

Architettura: UNStudio
Struttura: D'Appolonia S.p.a. (Genoa)
Impianti: Manens (Verona)
Traffico: Systematica (Milan)
Coordinamento progetto: Studio Augusti (Genoa)



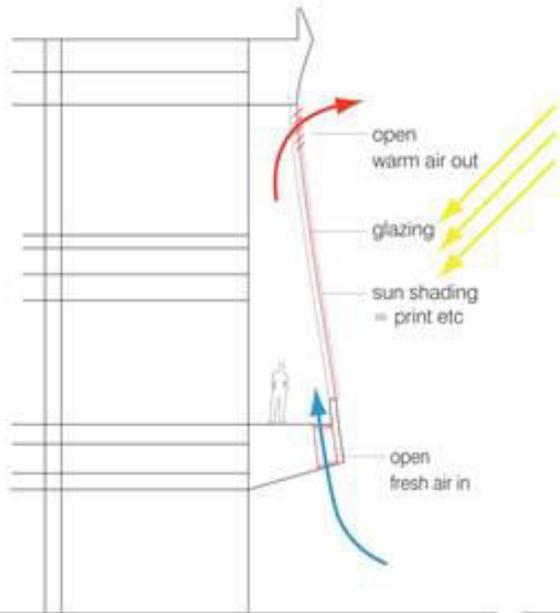
The Green Parameter- Ponte Parodi, UNStudio



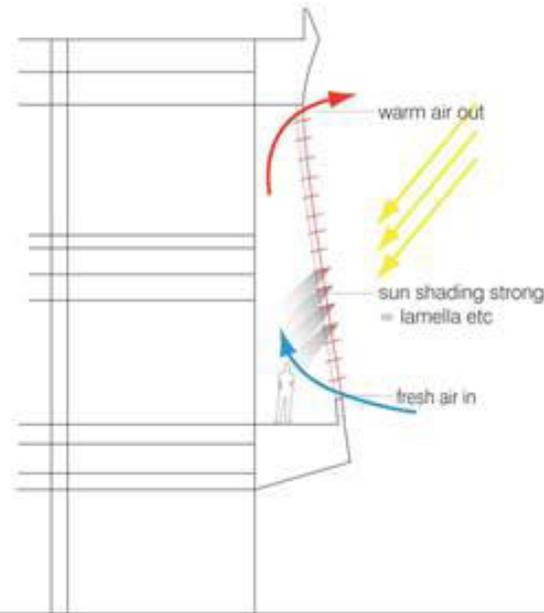
The Green Parameter- Ponte Parodi, UNStudio

SUMMER

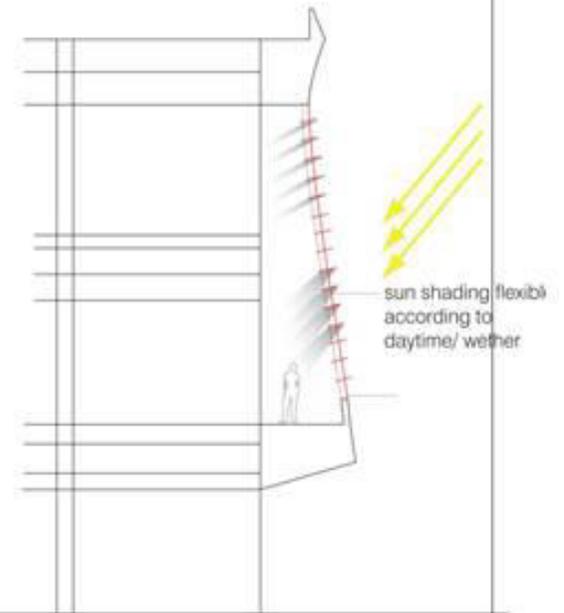
facade with climatic buffer



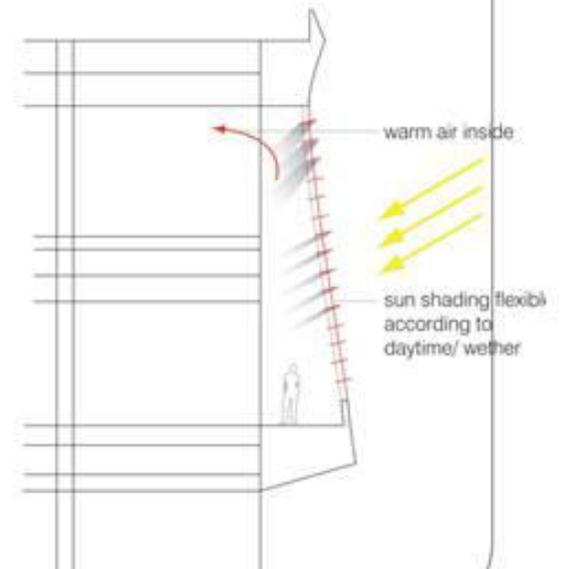
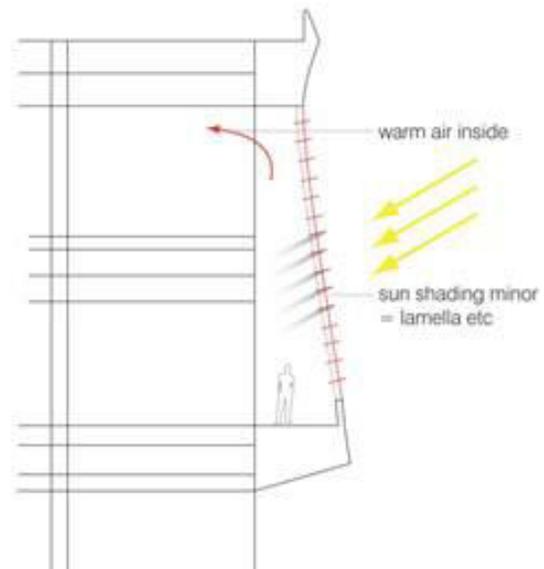
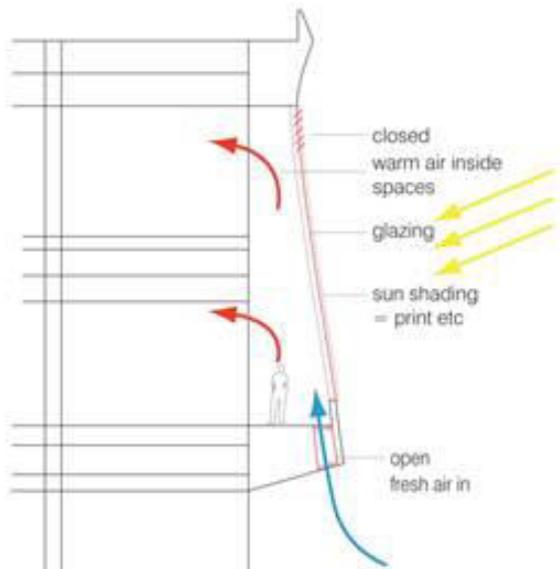
facade with fixed sunshading



facade with manipulated sunshading



WINTER



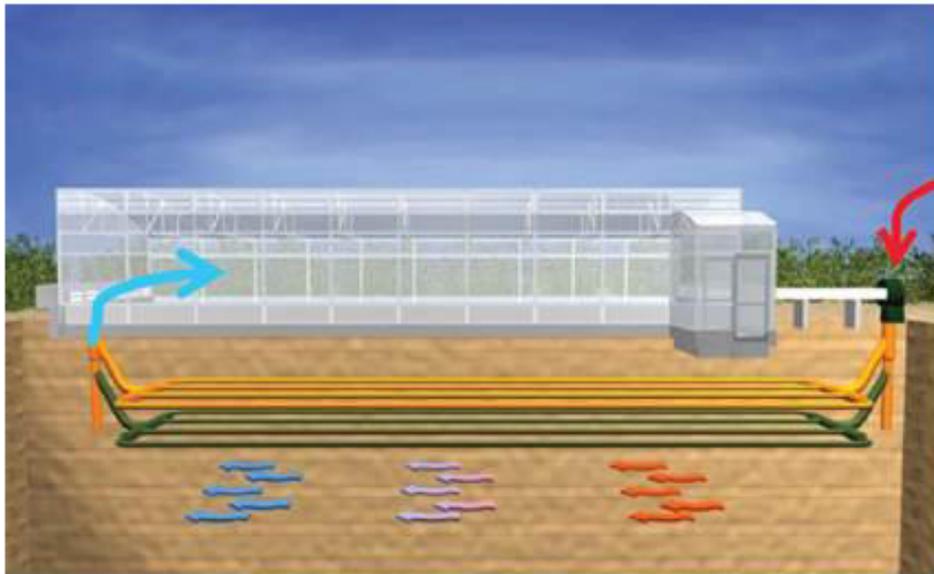
The Green Parameter- Ponte Parodi, UNStudio

Sistema impiantistico galleria

Sulla base delle ipotesi di progetto (affollamento, illuminazione e comfort) è stata realizzata un'analisi delle soluzioni impiantistiche con conseguente ottimizzazione dell'involucro edilizio.

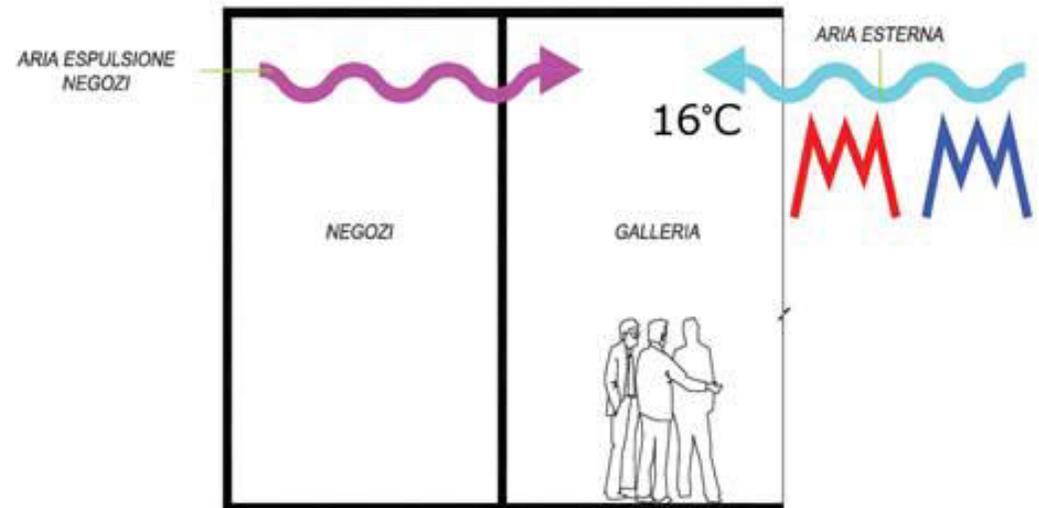
Obiettivo: raggiungere comfort diminuendo i consumi energetici

Soluzione progettuale: - 30% fabbisogni termici; - 85 fabbisogni elettrici; -85% costi annuali



Earth pipe system

Aria esterna di ventilazione calda in estate (o fredda in inverno) viene pre-raffreddata (o pre-riscaldata) attraverso scambio termico con il terreno ($t_{cost}=15C$) e poi inviata al sistema di climatizzazione meccanico



Galleria stemperata non climatizzata

Ventilazione+ post riscaldamento+ raffreddamento

The Green Parameter- Ponte Parodi, UNStudio



The Green Parameter- TwoFour54, UNStudio

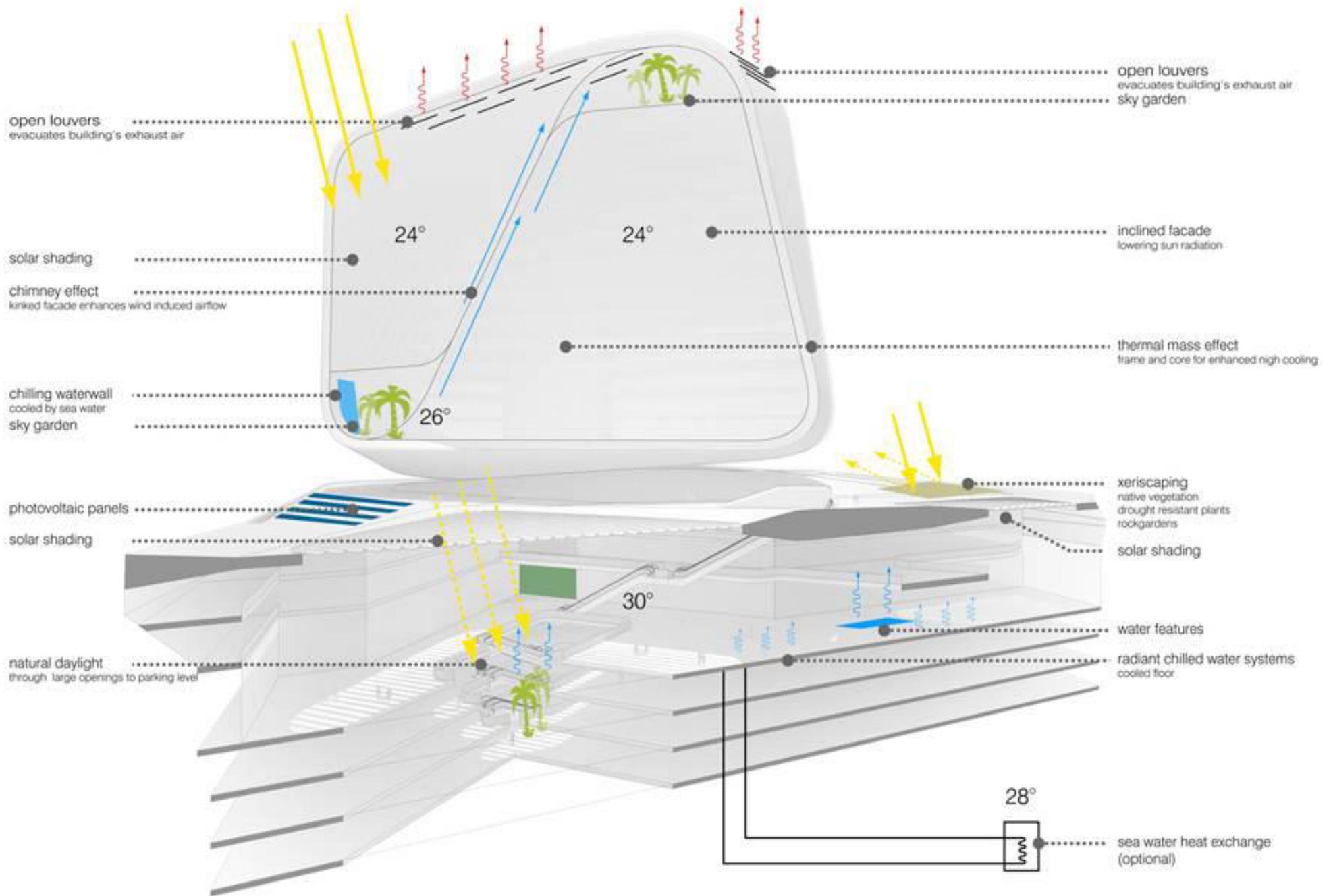
Architettura: UNStudio

Architetto Esecutivo: Adamson Associates International (Toronto, Canada)

Systems Engineering: Buro Happold (New York, USA)



The Green Parameter- TwoFour54, UNStudio



The Green Parameter- TwoFour54, UNStudio

DOUBLE-SKIN FAÇADE

- Design della superficie vetrata
- Alta qualità ambientale
- Implementazione di illuminazione media

DOUBLE-SKIN FAÇADE

- Alto comfort
- Qualità e quantità della luce
- Ambiente lavorativo sano e produttivo

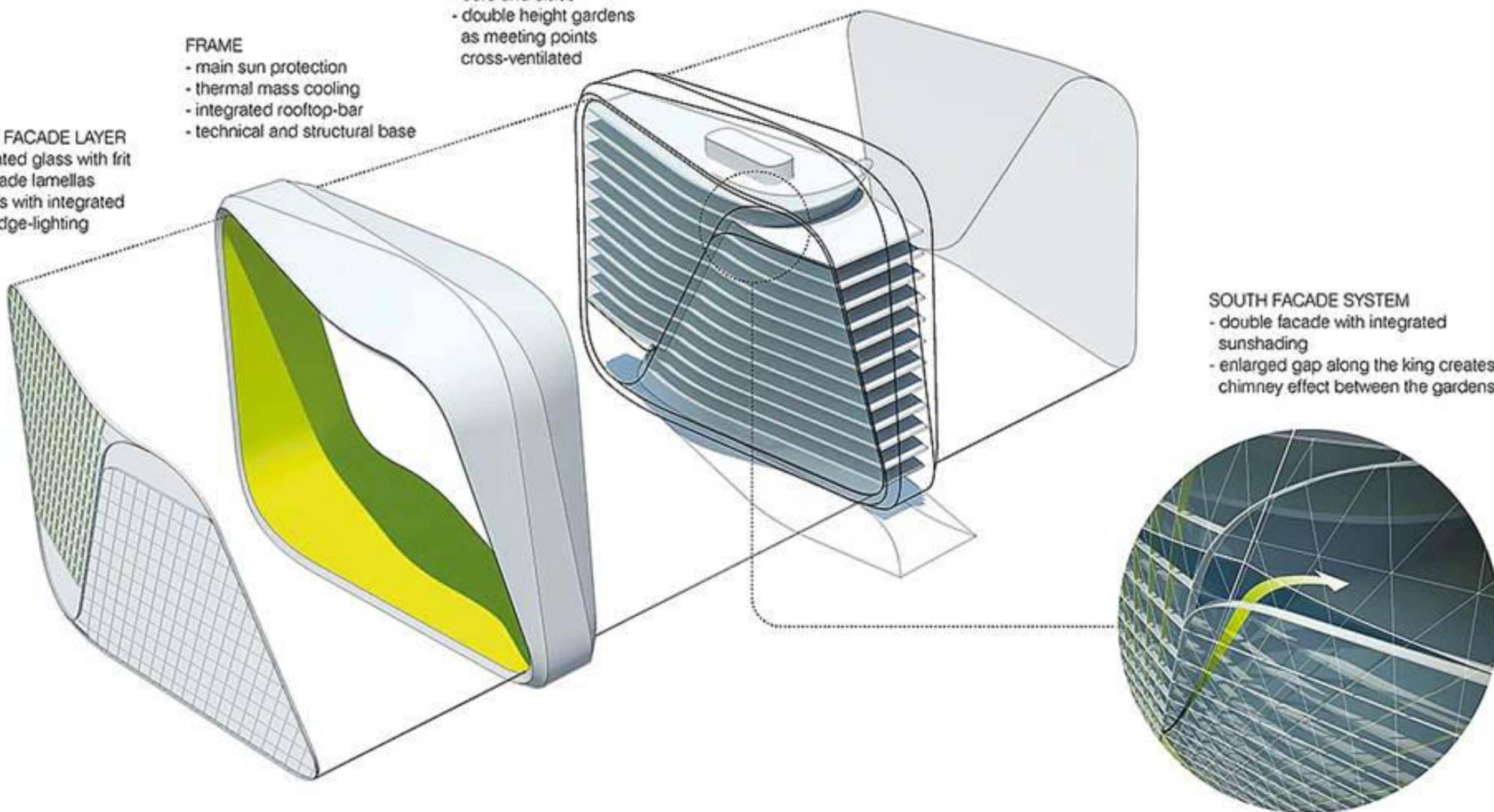
MAIN TOWER
- core and slabs
- double height gardens
as meeting points
cross-ventilated

NORTH FAÇADE
- isolation glazing

FRAME
- main sun protection
- thermal mass cooling
- integrated rooftop-bar
- technical and structural base

OUTER FAÇADE LAYER
- laminated glass with frit
- sunshade lamellas
- profiles with integrated
LED edge-lighting

SOUTH FAÇADE SYSTEM
- double facade with integrated
sunshading
- enlarged gap along the king creates
chimney effect between the gardens



The Green Parameter- TwoFour54, UNStudio



TAUGHT SCREEN IN DAY



ENVIRONMENTAL QUALIFICATION



MEDIA SCREEN AT NIGHT

The Green Parameter- TwoFour54, UNStudio

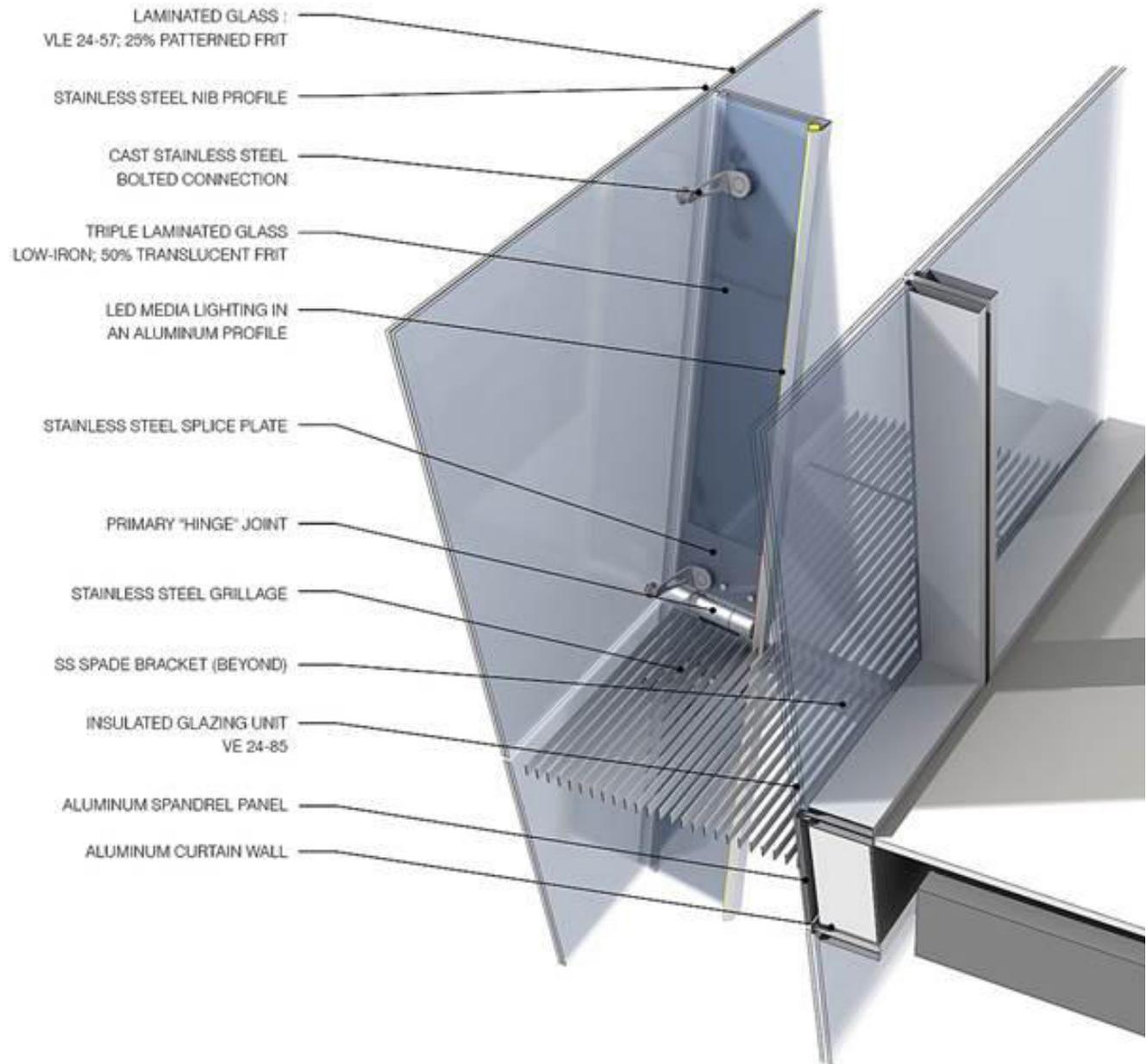
DOUBLE-SKIN FAÇADE

Facciata interna semplice:

- Protezione da riscaldamento della cavità

Facciata esterna

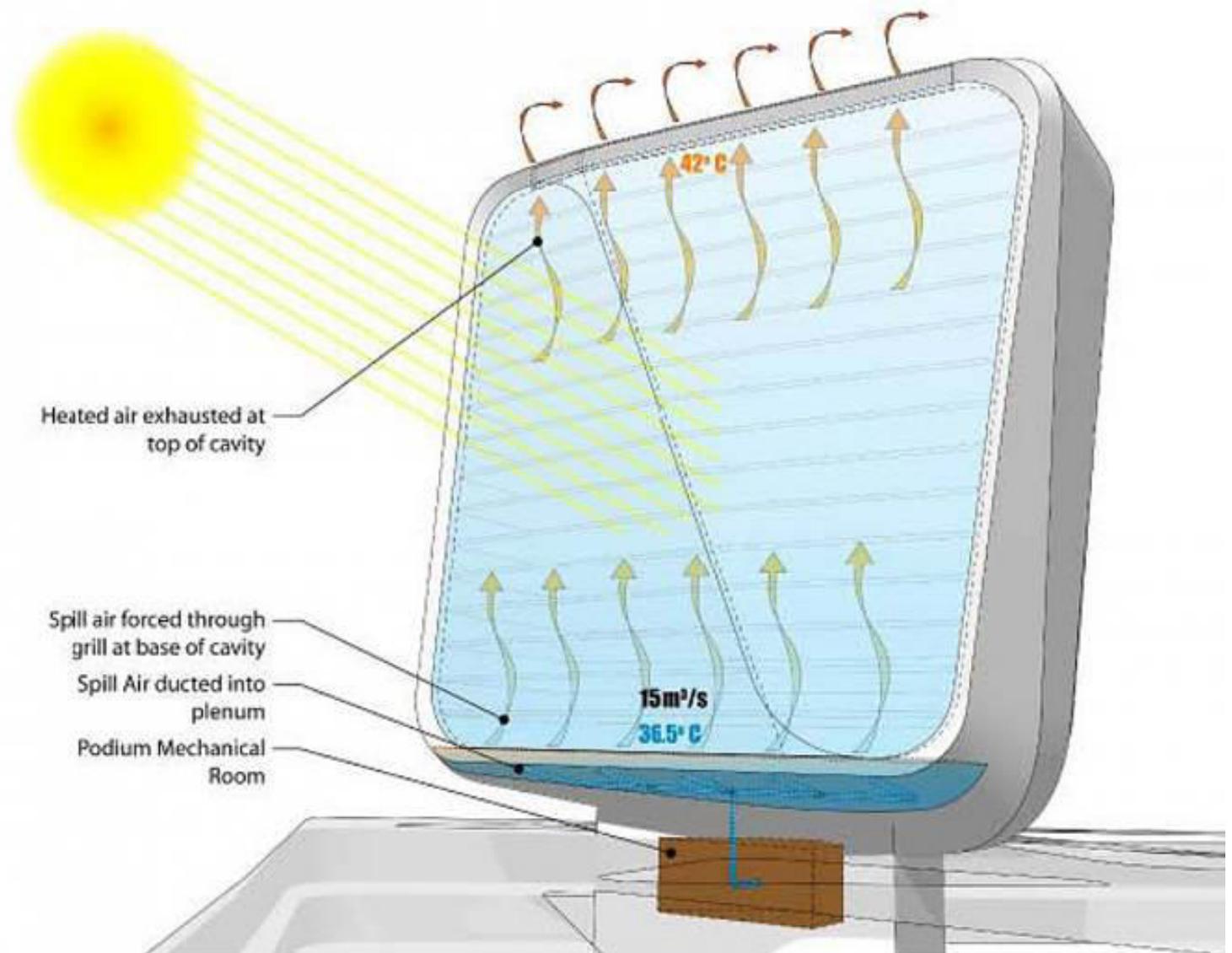
- Protezione solare e ombreggiamento



The Green Parameter- TwoFour54, UNStudio

DOUBLE-SKIN FAÇADE

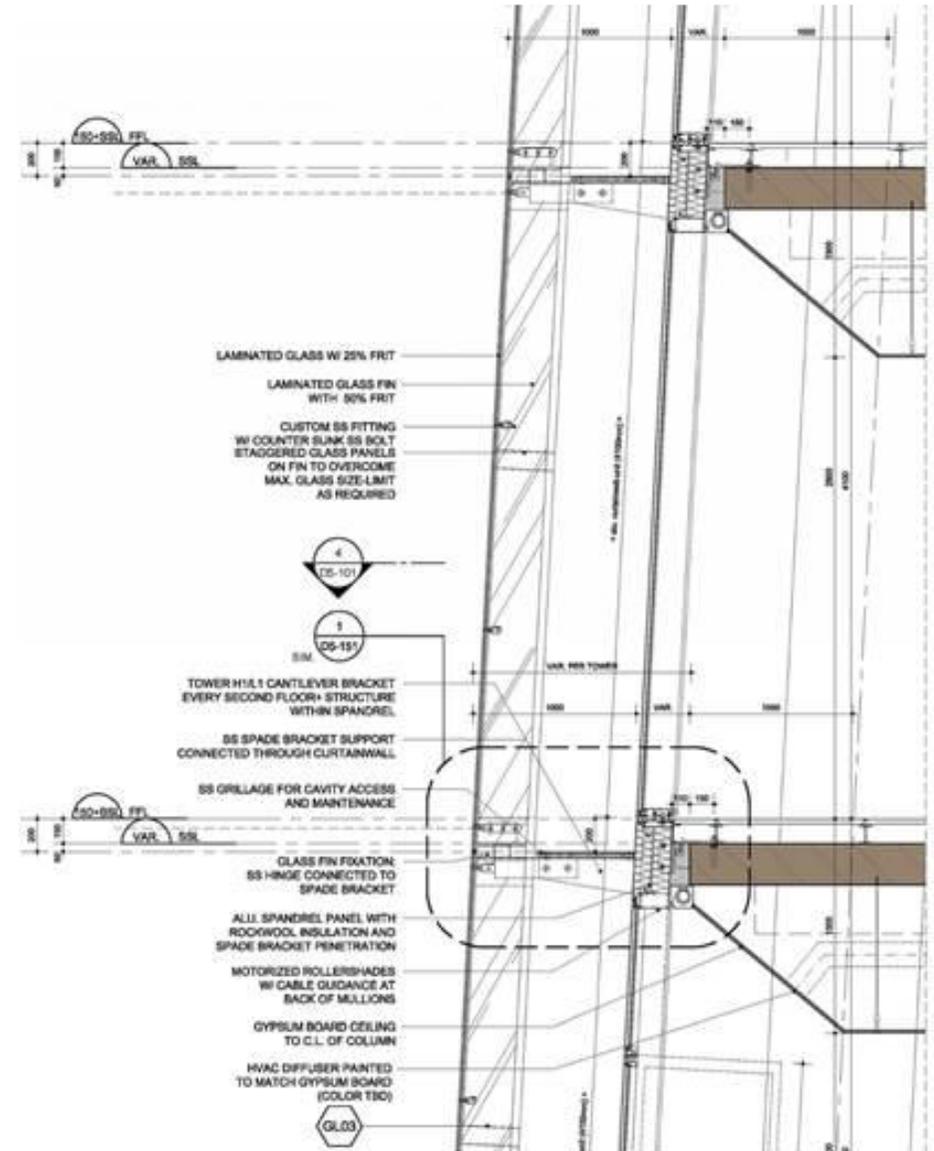
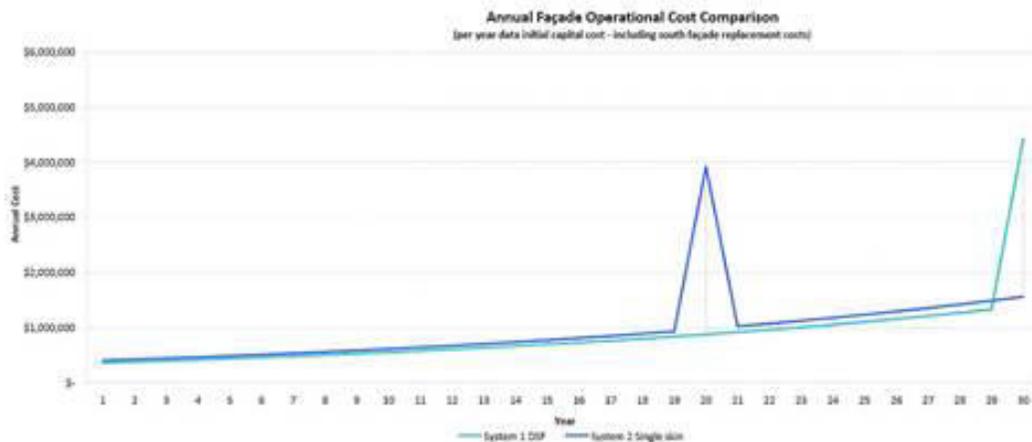
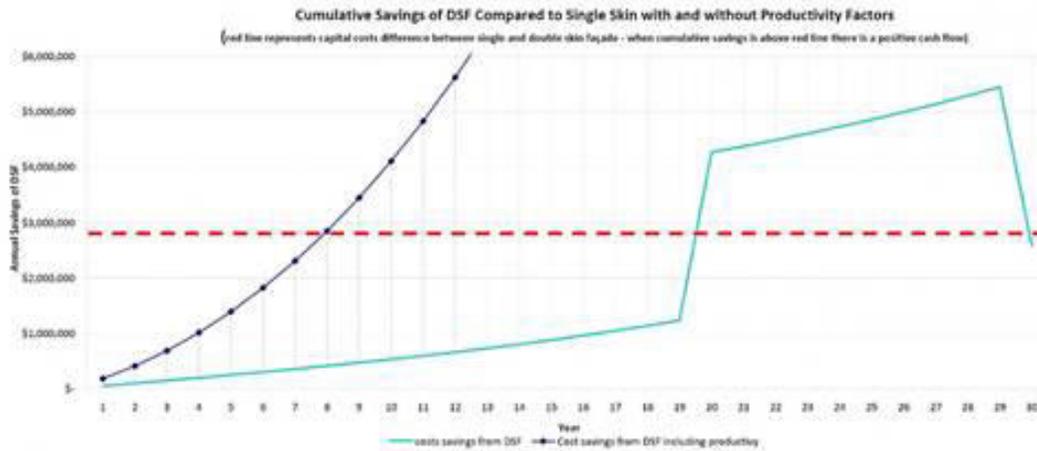
- Espulsione aria impianti del podio
- Raffreddamento aria all'interno della cavità



The Green Parameter- TwoFour54, UNStudio

DOUBLE-SKIN FAÇADE

- Benefici a lungo termine
- Ciclo di vita più lungo
- Benefici economici annuali

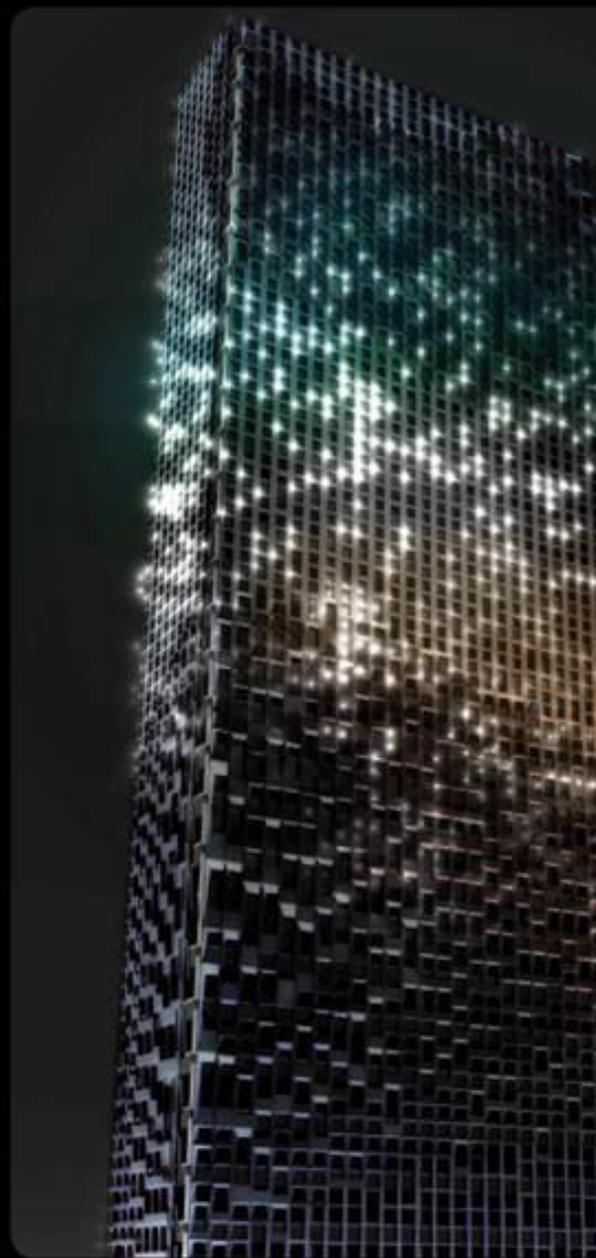
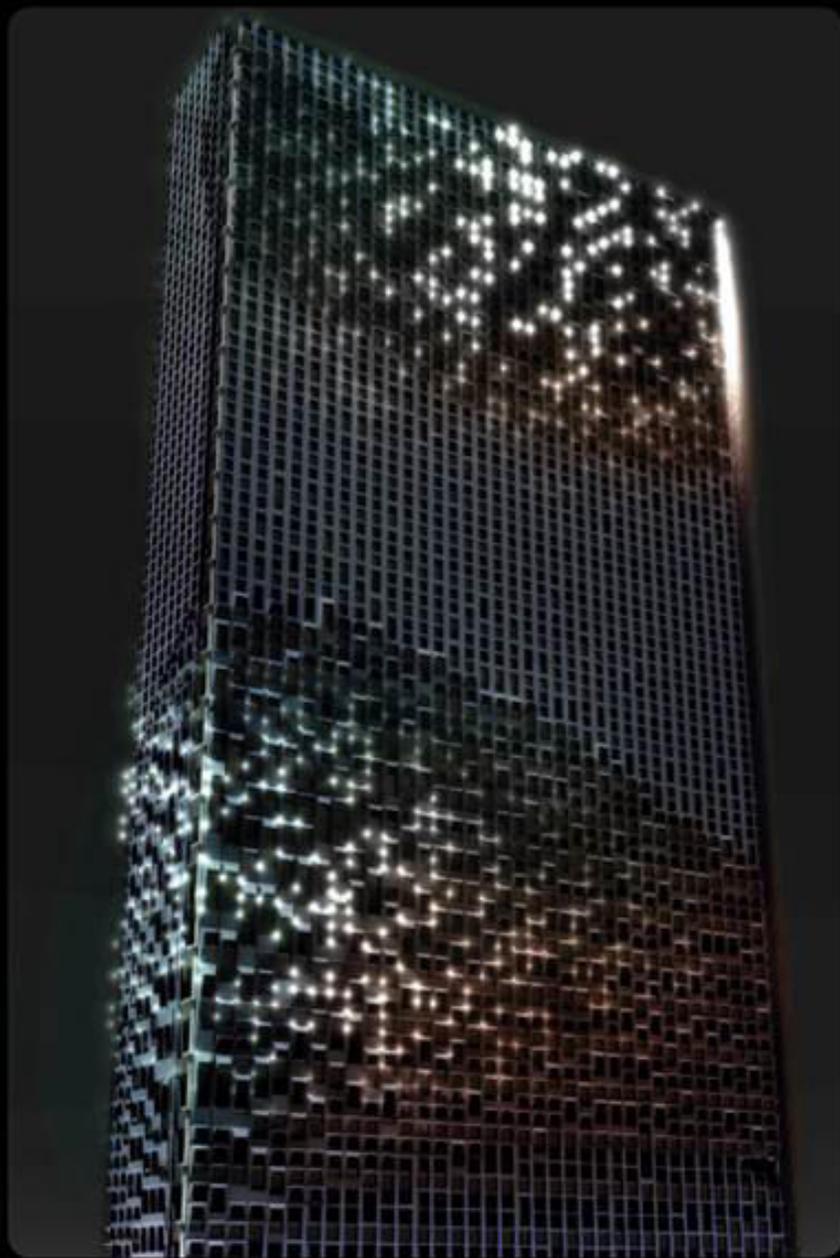
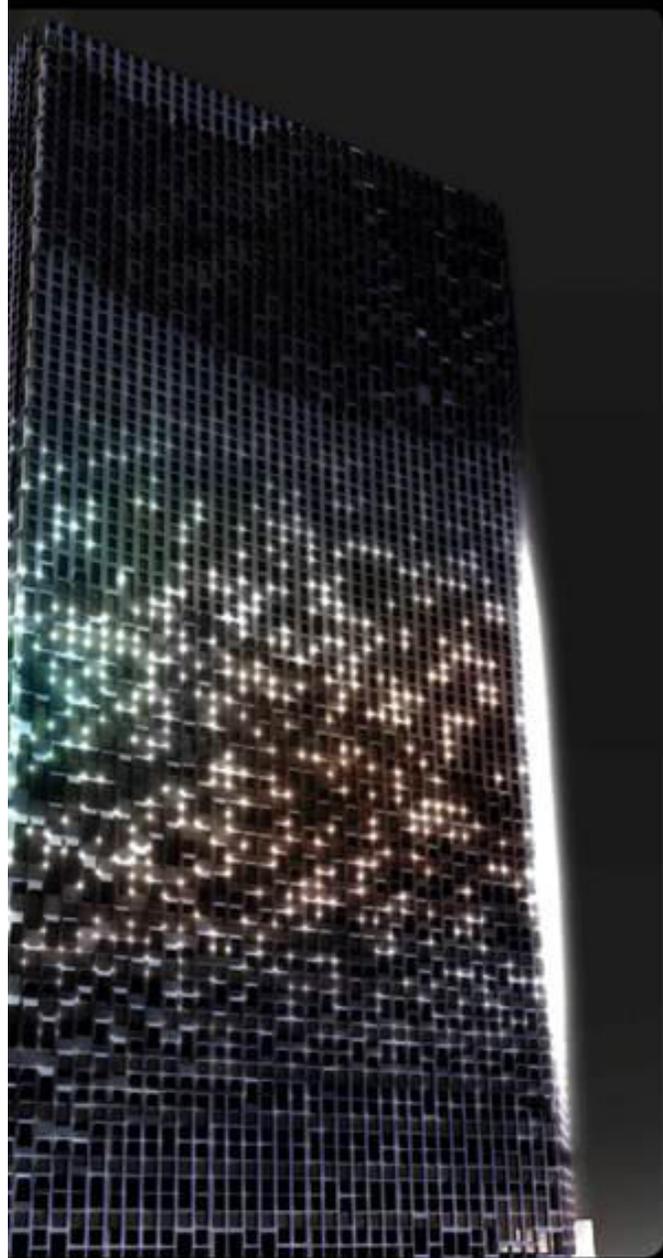


The Green Parameter- TwoFour54, UNStudio



The Green Parameter- Hanwha, UNStudio





The Green Parameter- Hanwha, UNStudio

FAÇADE PRIORITIES

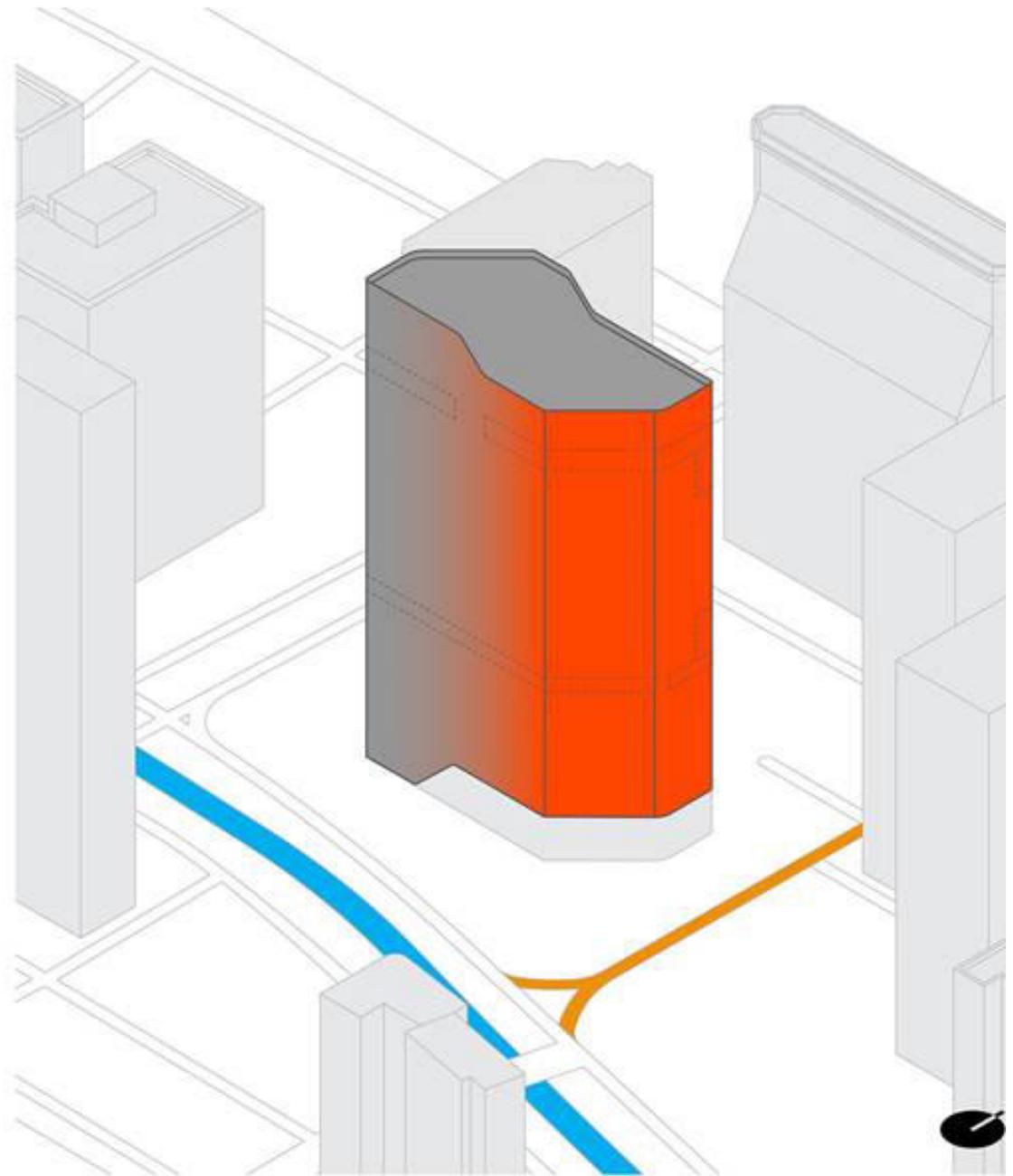
- Programma (esterno e interno)
- Comfort interno
- Considerazioni ambientali

Disposizione facciata secondo:

- Sole e protezione solare
- Programma interno
- Composizione estetica

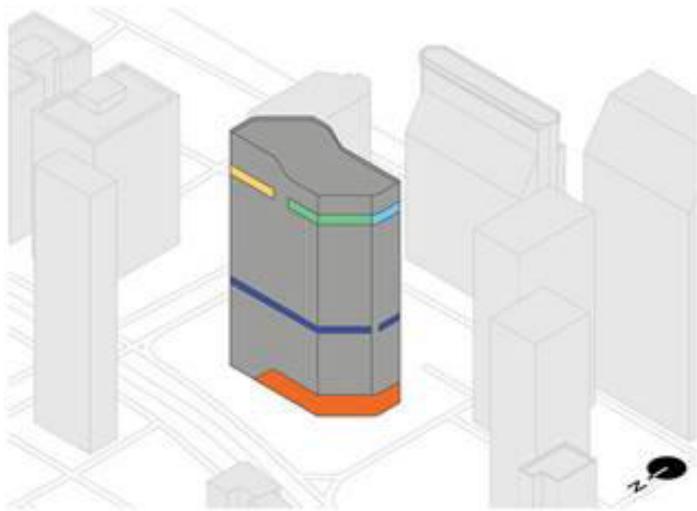
BOUNDARY MARKER DIAGRAM

-  Proposed distinctive part of facade
-  Cheonggyecheon Stream
-  Hanbit Avenue

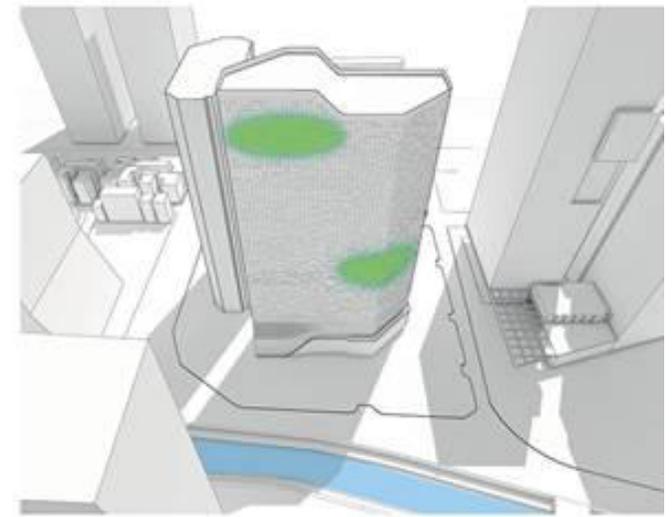
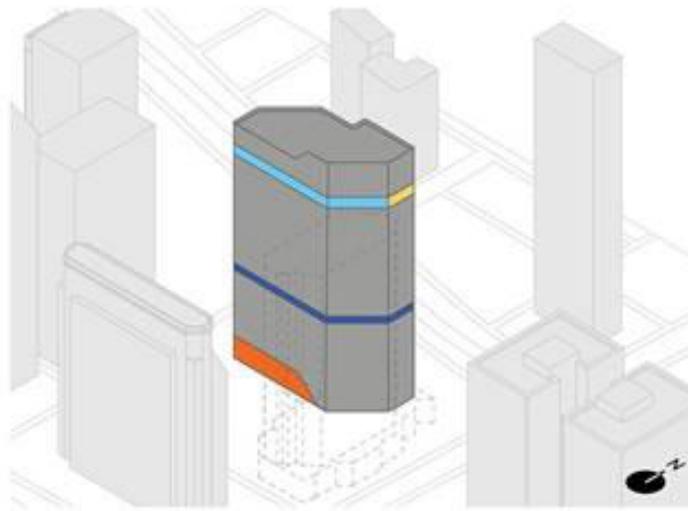


The Green Parameter- Hanwha, UNStudio

L'espressività della facciata si basa sul programma.



PROGRAM DIAGRAM

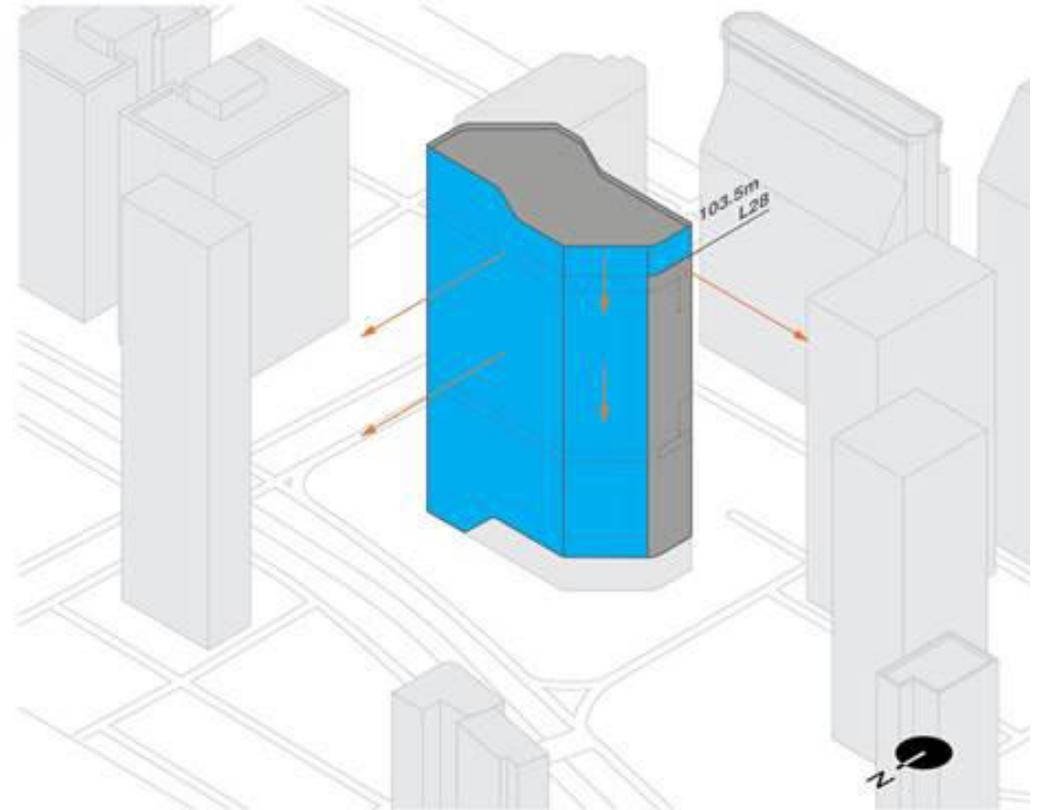
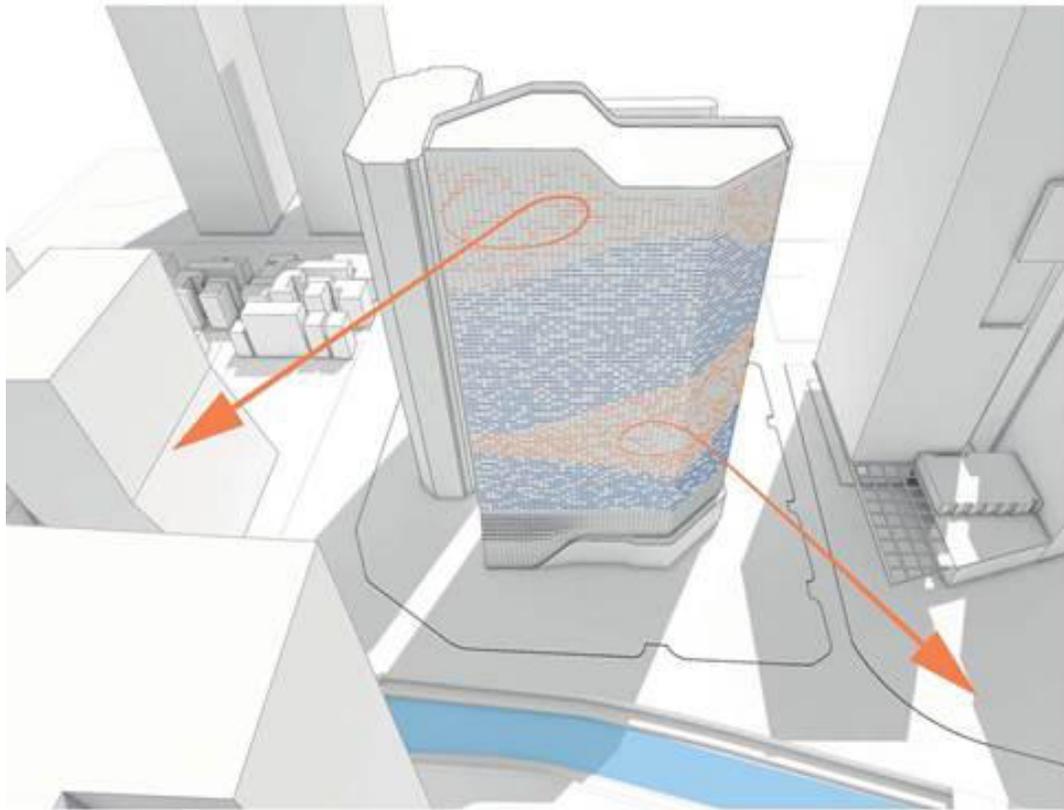


SKY GARDEN LOCATIONS

- | | | | |
|---|--------------|---|---------------------|
|  | Auditorium |  | Proposed Skygardens |
|  | Seminar Room |  | Offices |
|  | Meeting Room |  | Lobby |

The Green Parameter- Hanwha, UNStudio

Varietà posizione dei pannelli – varietà del programma e della luce

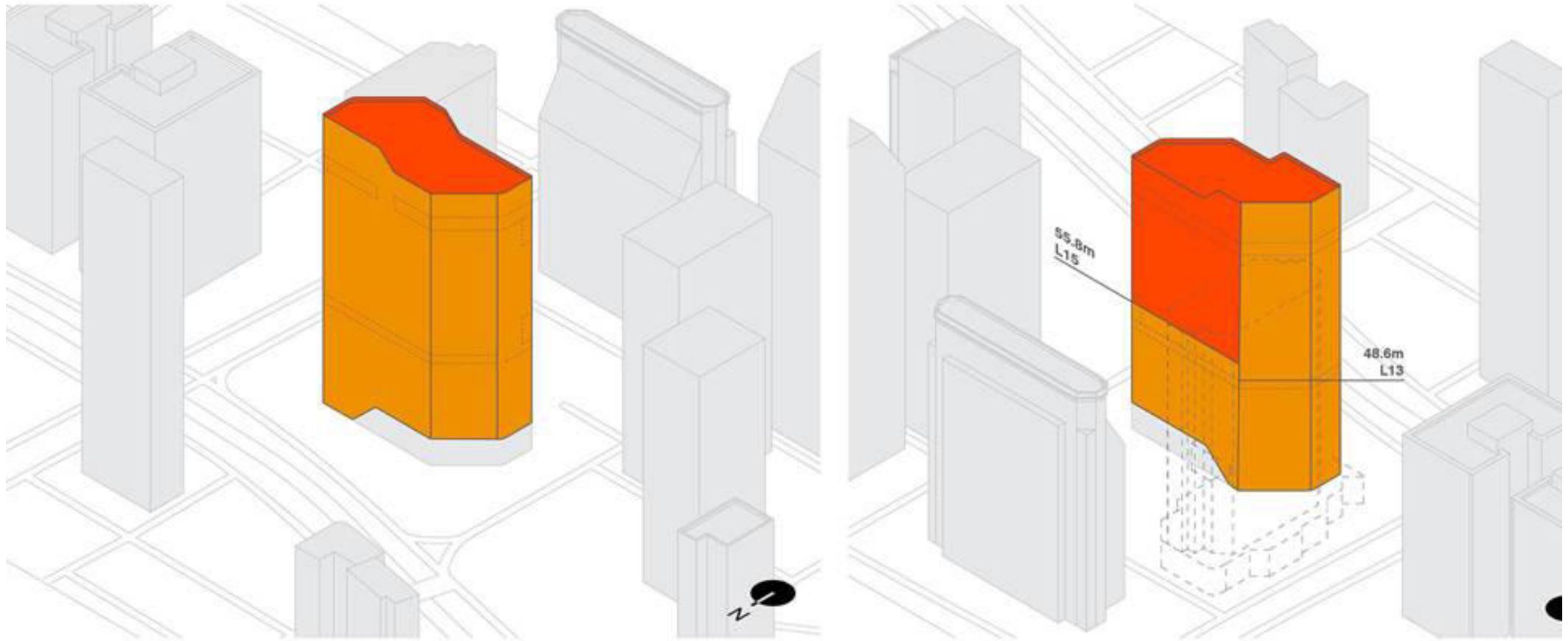


NORTH VIEWS

-  Areas with unobstructed views
-  Areas with obstructed views
-  Views

The Green Parameter- Hanwha, UNStudio

Analisi dell'impatto diretto del sole



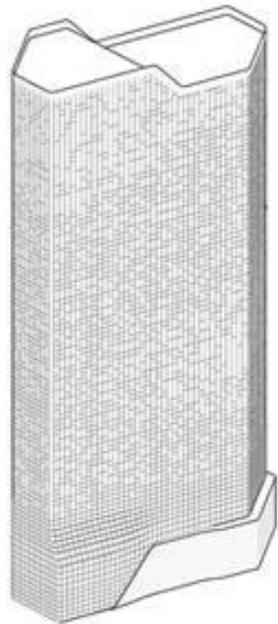
SUNLIGHT EXPOSURE DIAGRAM

-  Great amount of direct sunlight
-  Small amount of direct sunlight

The Green Parameter- Hanwha, UNStudio

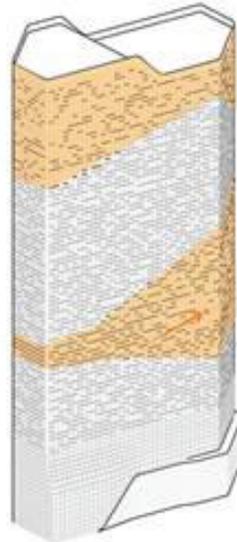
Porzione di elementi angolati: protezione impatto diretto

Porzione di elementi standard: apertura alla luce diretta

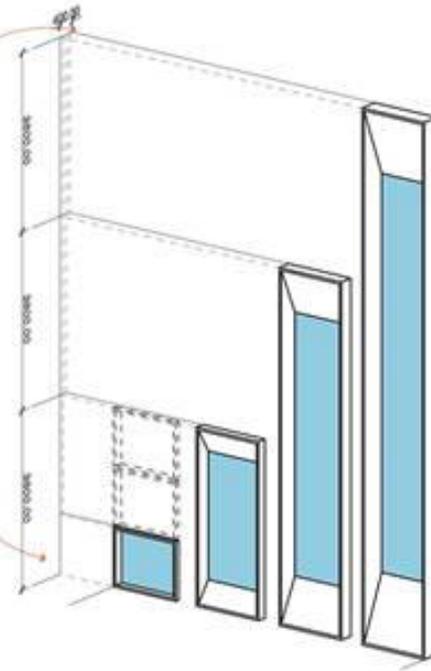


North Facade

35%



A-Typical Office, Meeting, Restaurant + Winter Garden Area



A-Typical Module

65%



Standard Module

Winter Garden



Depth of different type panel



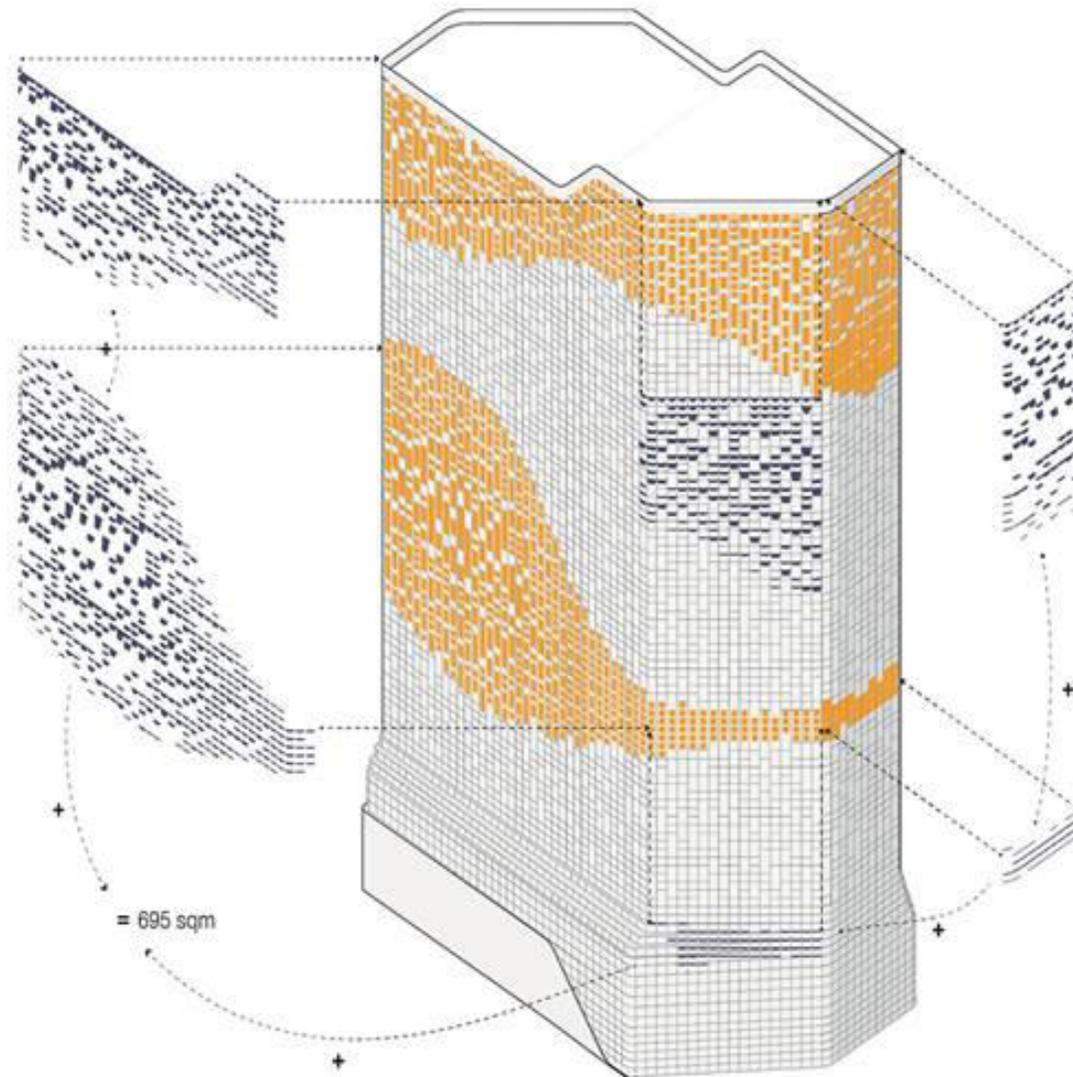
Amount of mixed type panel



The Green Parameter- Hanwha, UNStudio

Celle fotovoltaiche

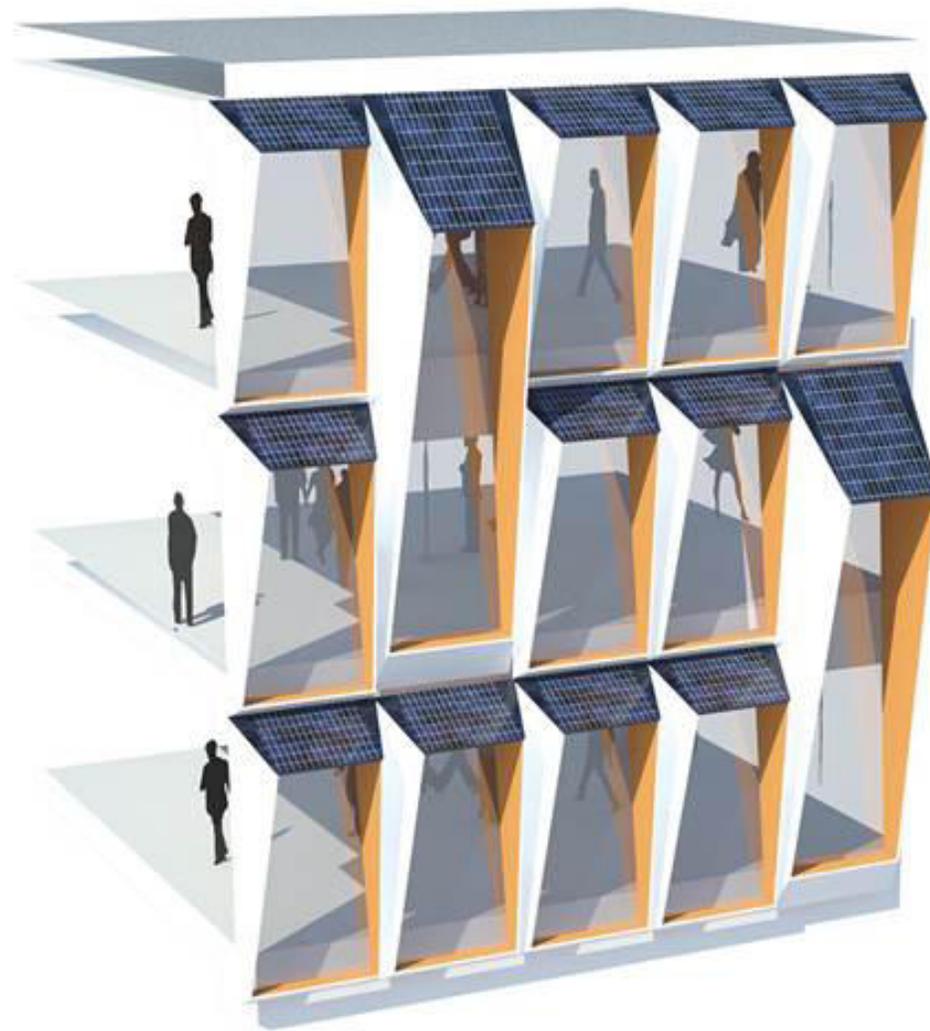
- Posizione ottimale rispetto al sole diretto



PV cell placement on South/Southeast facade = 695 SM

The Green Parameter- Hanwha, UNStudio

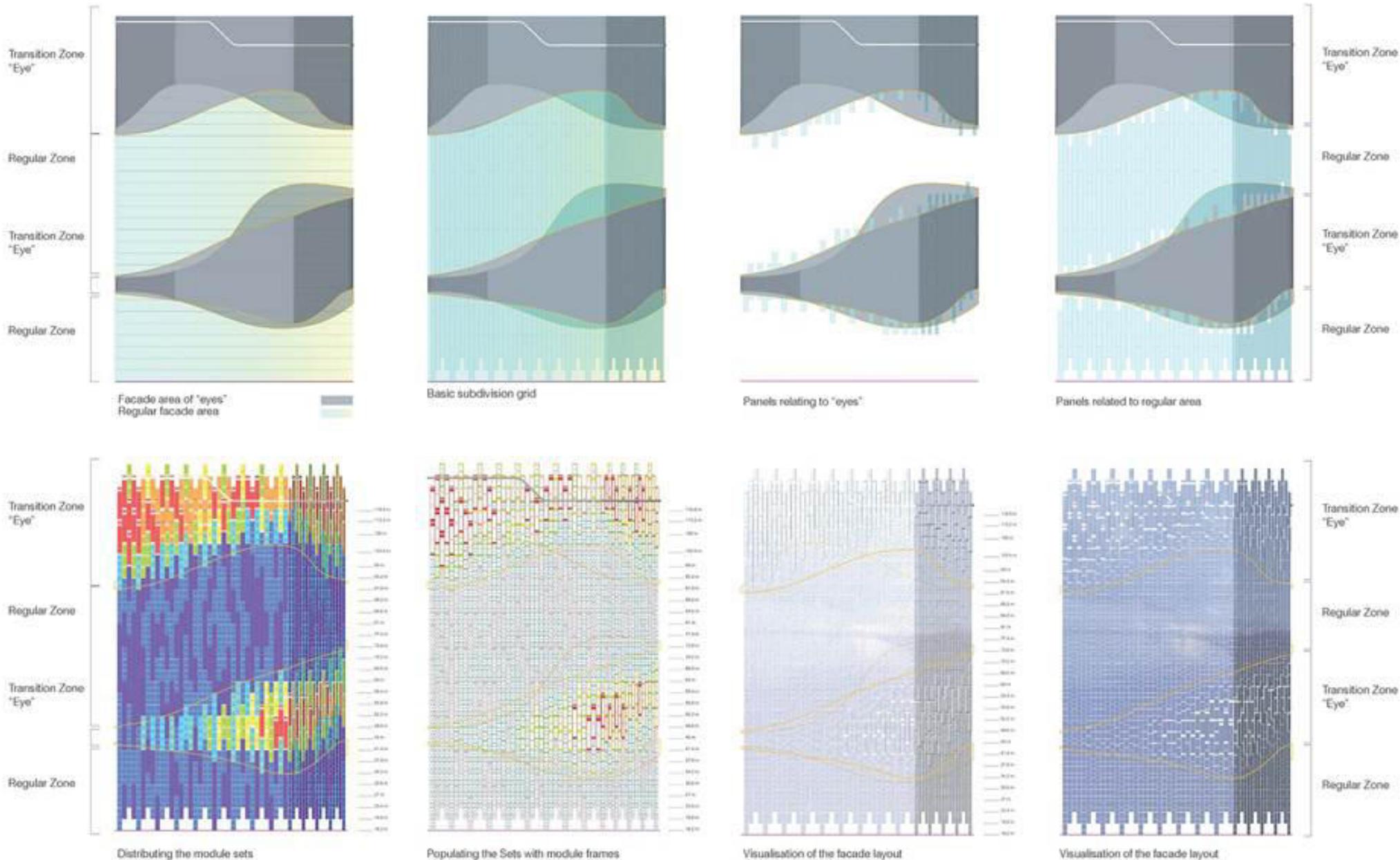
Ottimizzazione del posizionamento delle celle fotovoltaiche



BIPV FACADE DETAIL

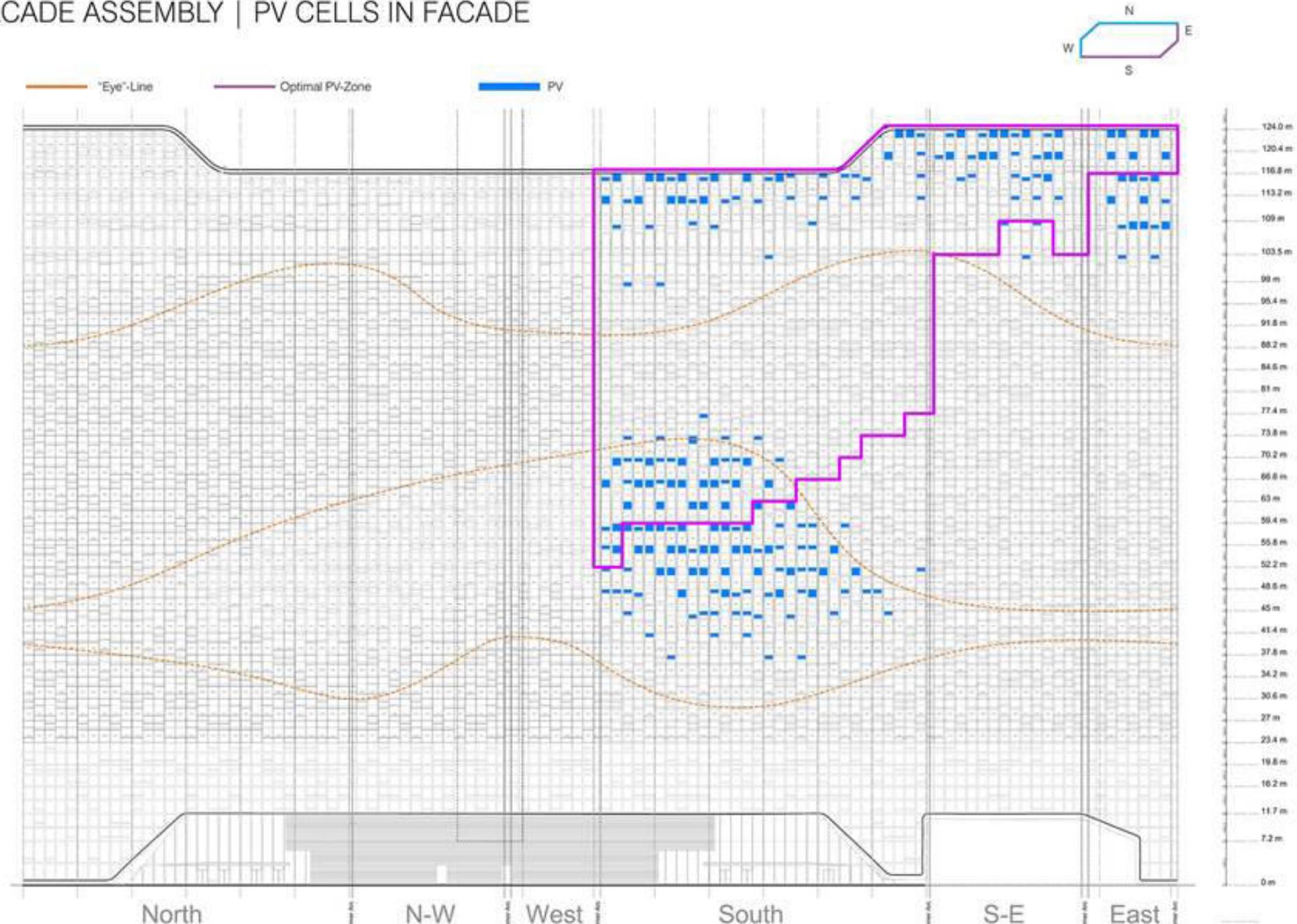
The Green Parameter- Hanwha, UNStudio

FACADE ASSEMBLY | SETUP STRATEGY



The Green Parameter- Hanwha, UNStudio

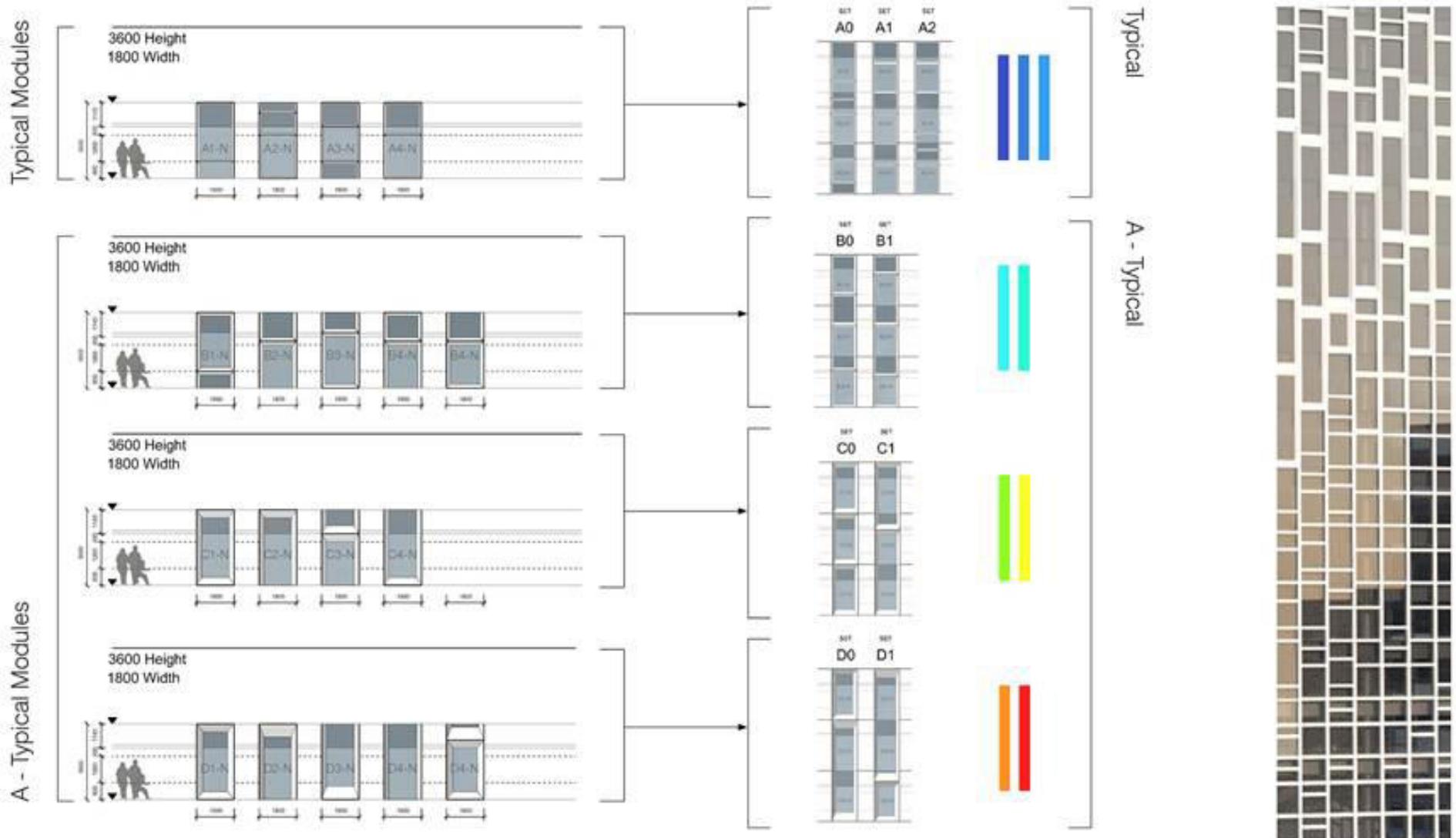
FACADE ASSEMBLY | PV CELLS IN FACADE



The Green Parameter- Hanwha, UNStudio

FACADE MODULES | NORTH

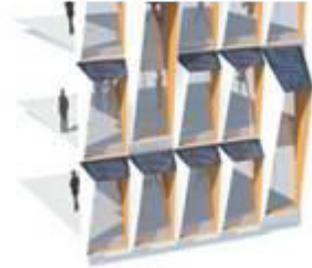
Overview of base modules - 1800mm width, 3600mm height



The Green Parameter- Hanwha, UNStudio

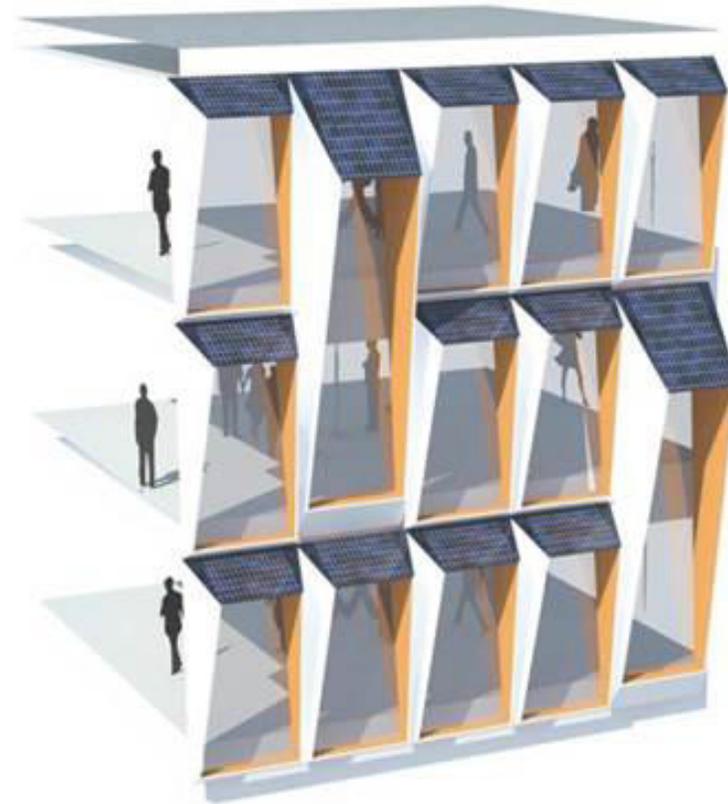
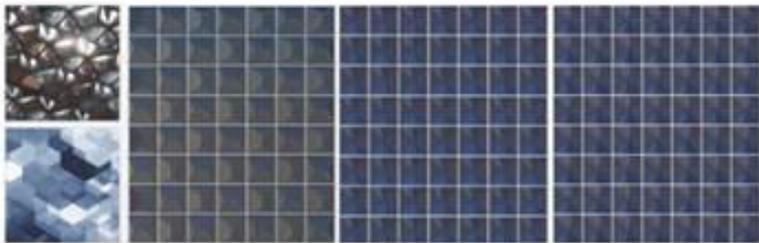
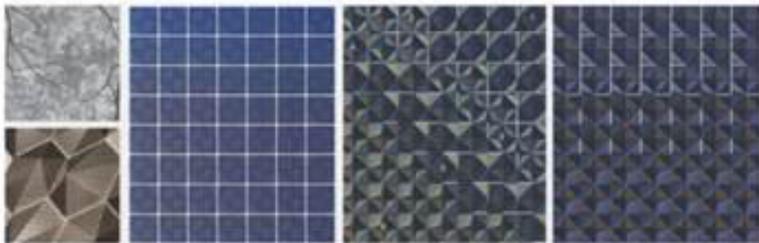
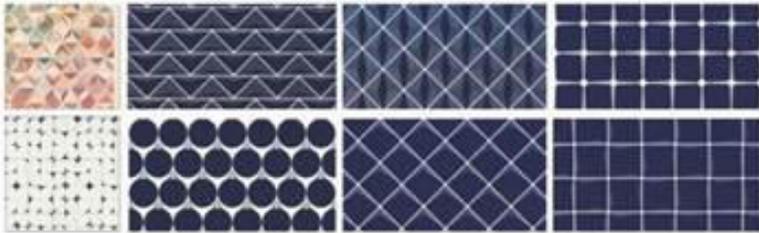
INTEGRATED PV FACADE CREATES HIGH QUALITY OFFICE BUILDING

- SUSTAINABLE AND ATTRACTIVE BRANDED IDENTITY TO THE OUTSIDE*
- QUALITY OFFICE SPACE WITH NATURAL LIGHT AND GOOD VIEWS INSIDE*
- PROJECT CURRENTLY BEING BUILT*



The Green Parameter- Construct PV, UNStudio

INNOVATION FROM PV-MODULE TO BUILDING ENVELOPE IN TWO PROJECTS:



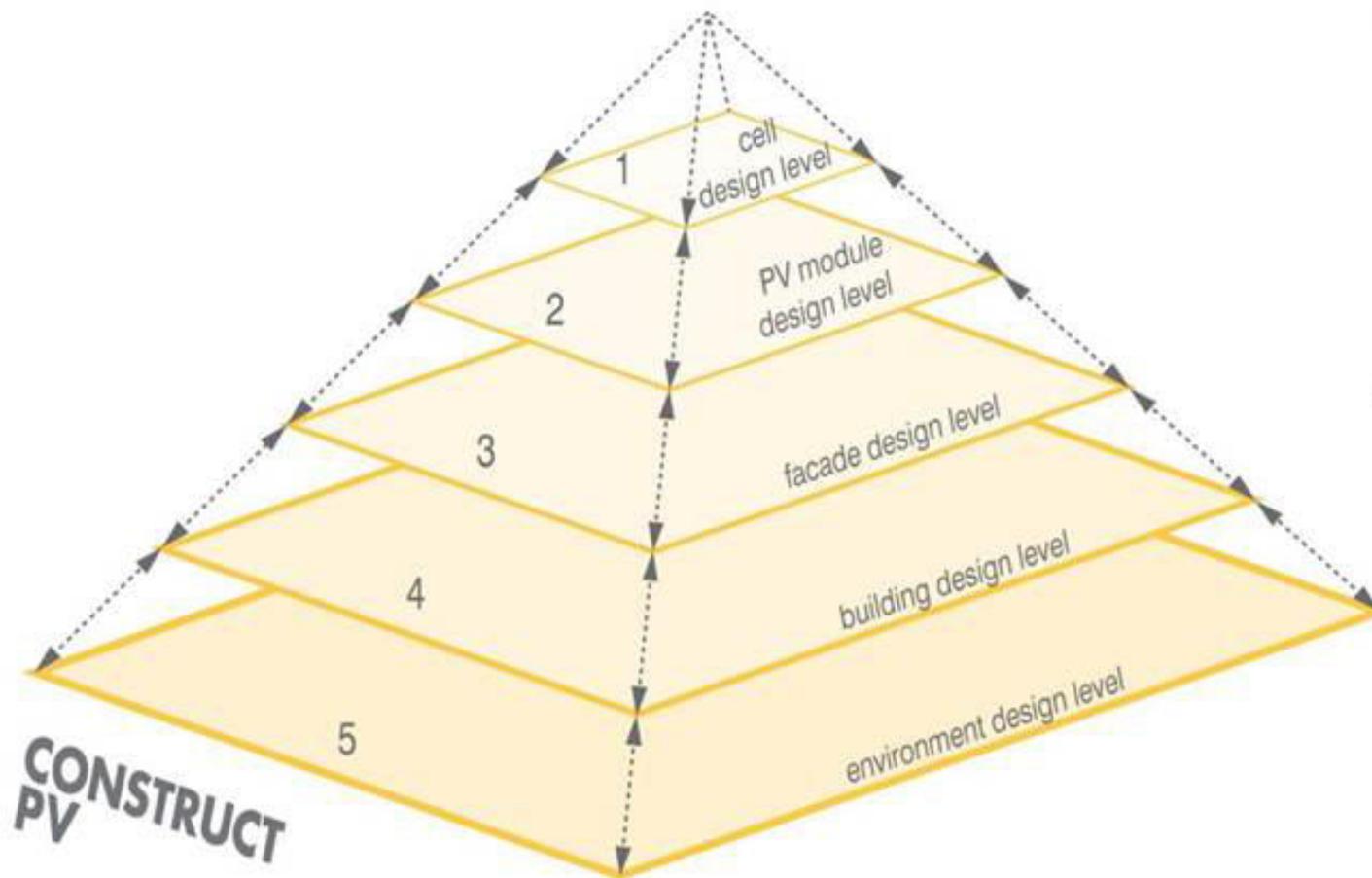
CONSTRUCT-PV:
AESTHETIC AND COST EFFECTIVE PV
- ARCHITECTURAL LAYERING IN PV MODULES

HANWHA:
PERFORMATIVE BIPV ENVELOPE DESIGN
- NON APPARENT REPETITION OF PV MODULES

The Green Parameter- Construct PV, UNStudio

CONSTRUCT-PV: AESTHETIC AND COST EFFECTIVE PV

- RESEARCH ON DIFFERENT ARCHITECTURAL SCALE LEVELS
- FROM MATERIAL AND CELL LEVEL TO URBAN SCALE LEVEL
- CATALOGUE OF STANDARDIZED DESIGN OPTIONS



European Research (FP7)

Consortium partners:

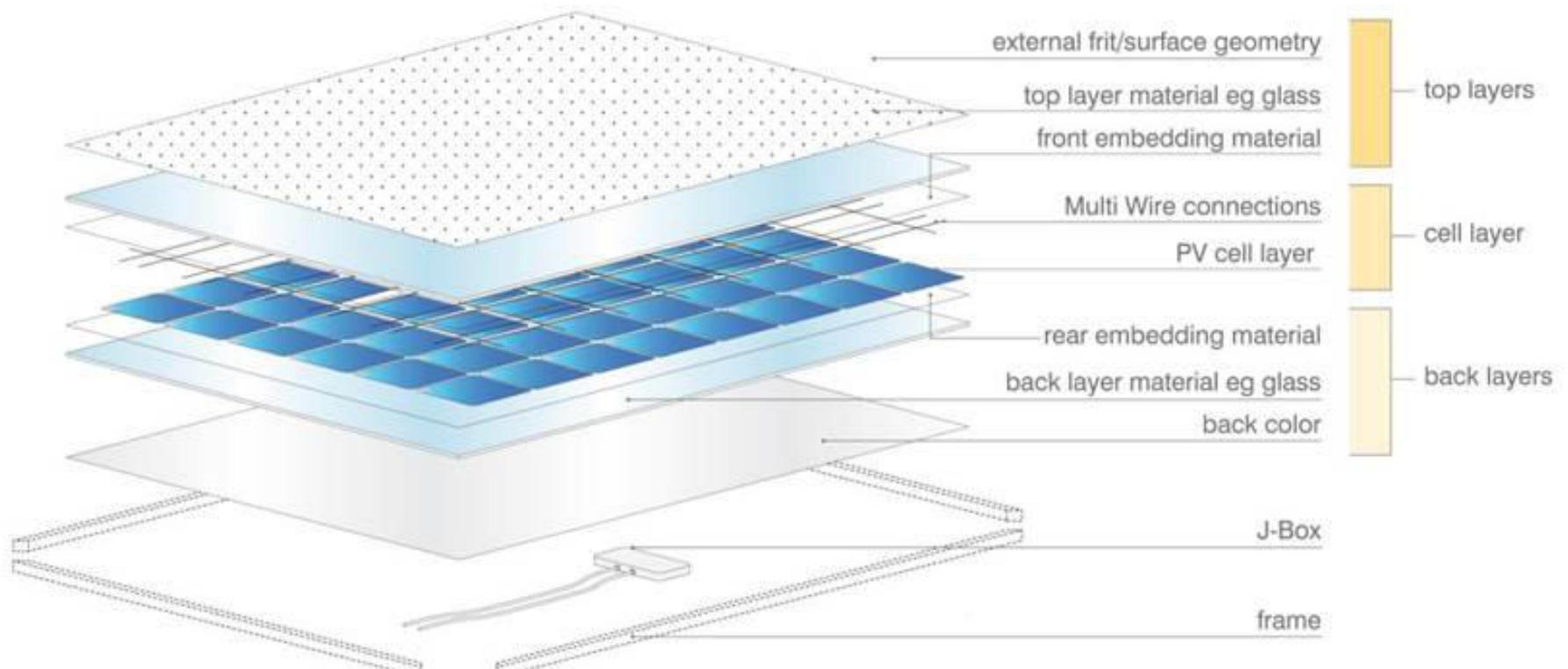
Züblin, Germany
D'Appolonia, Italy
Fraunhofer-ISE, Germany
Meyer Burger, Switzerland
NTUA, Greece
AMS, Greece
SUPSI, Switzerland
ENEA, Italy
TU Dresden, Germany
Tegola Canadese, Italy

www.constructpv.eu
FP7 - 2012-2016

The Green Parameter- Construct PV, UNStudio

CONSTRUCT-PV: ARCHITECTURAL LAYERING

- DISSECTING AND REARRANGING EXISTING TECHNOLOGY
- DESIGN POSSIBILITIES WITHIN THE LAYERING IN PV MODULES
- AVAILABLE LAYERS:
 - TOP LAYERS: DESIGN OF GLASS FINISHING
 - CELL LAYERS: DESIGN OF CELL PLACEMENT AND COLOR OF CELLS
 - BACK LAYERS: DESIGN OF GLASS BACK PANEL COLORING



The Green Parameter- Construct PV, UNStudio

TOP LAYERS: DESIGN OF GLASS FINISHING

SILK SCREEN PRINTING



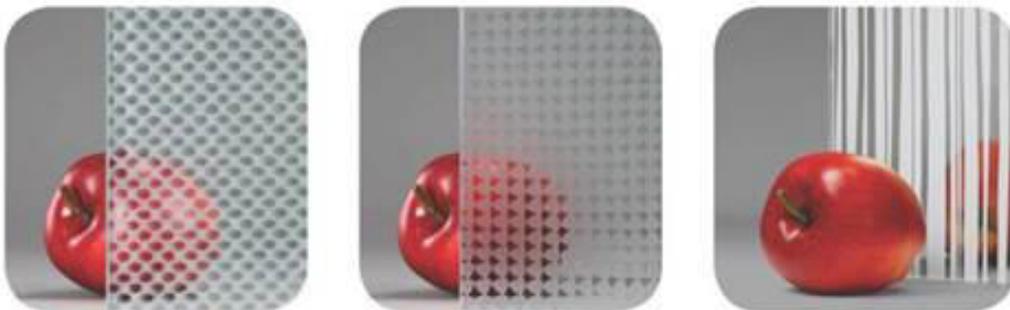
MATERIAL TRANSPARENCY



- PATTERN DESIGN ON TOP GLASS LAYER

*- PREFABRICATED BY GLASS PRODUCER
- ASSEMBLED IN PV PRODUCTION LINE*

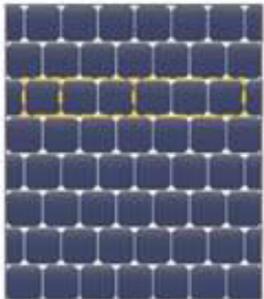
ETCHED GLASS



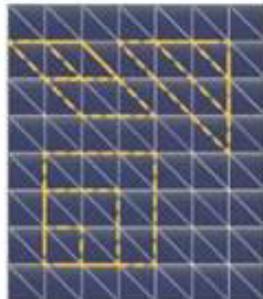
The Green Parameter- Construct PV, UNStudio

CELL LAYERS: DESIGN OF PLACEMENT AND COLOR OF CELLS

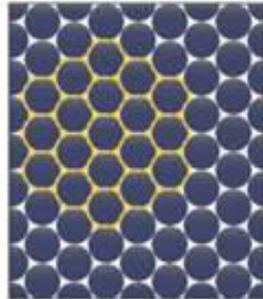
ORTHOGONAL



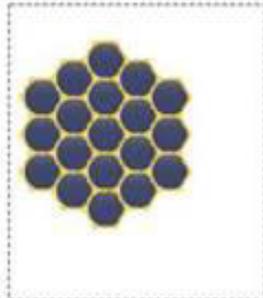
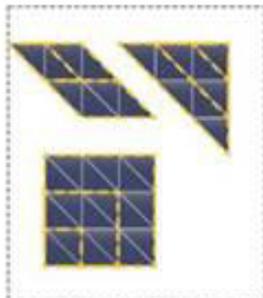
TRIANGULAR



CIRCULAR

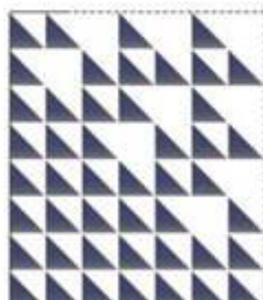
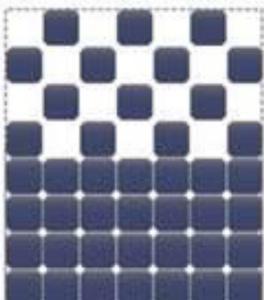


PATTERNS



- PLACEMENT DEPENDS ON PRODUCTION LINE
- DIFFERENT DESIGNS POSSIBLE

CELL COVERAGE

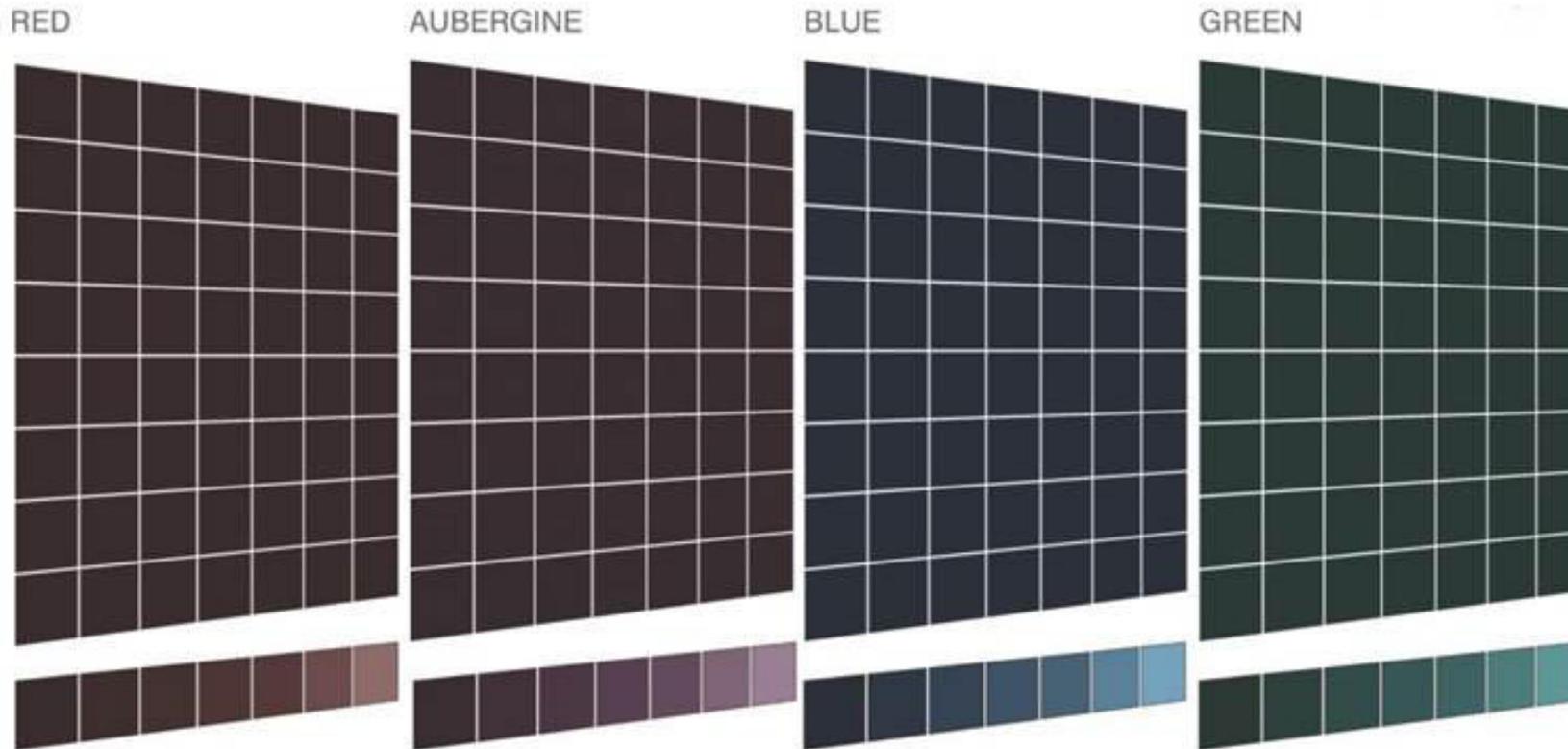


- CELL COVERAGE IS REDUCED
- HIGH COVERAGE REQUIRED FOR EFFICIENCY

The Green Parameter- Construct PV, UNStudio

CELL LAYERS: DESIGN CELL COLORS

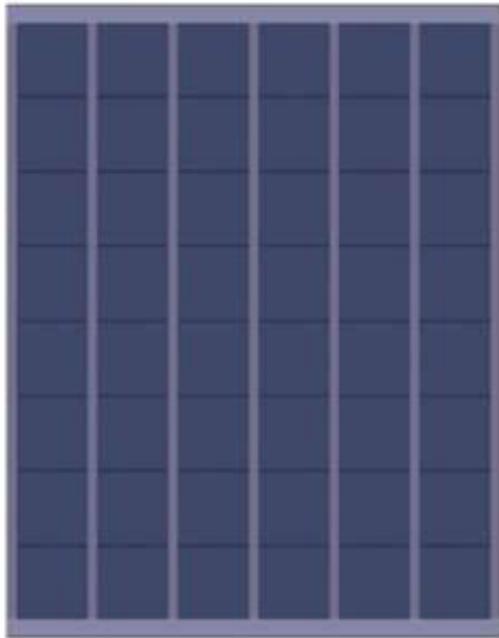
PROPOSED RANGE OF COLORS FOR PV CELLS, IN THE DARK COLOR RANGE



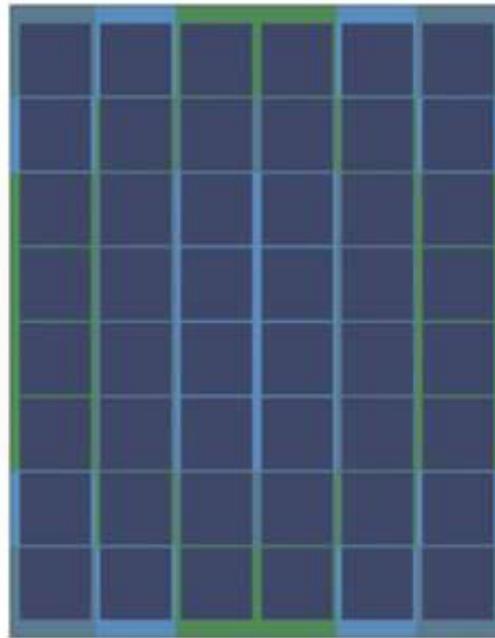
- *COLORS IN THE DARK RANGE FOR CELL EFFICIENCY*
- *CAN BE ADAPTED TO LOCATION SPECIFIC INFLUENCES AND REQUIREMENTS*

The Green Parameter- Construct PV, UNStudio

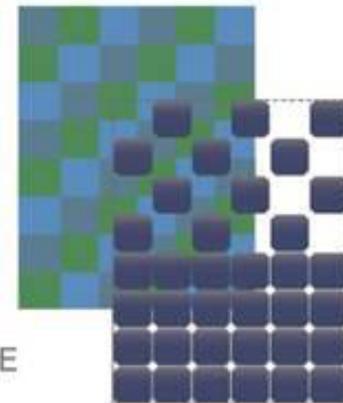
BACK LAYERS: DESIGN OF GLASS BACK PANEL COLORING



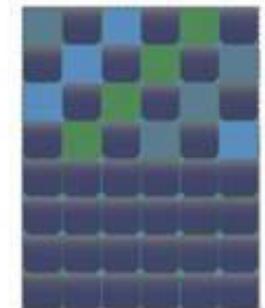
BACK COLOR SIMILAR TO CELLS



BACK COLOR IN SIMILAR COLOR RANGE



BACK COLOR DESIGN WITH TRANSPARENT CELL PLACEMENTS

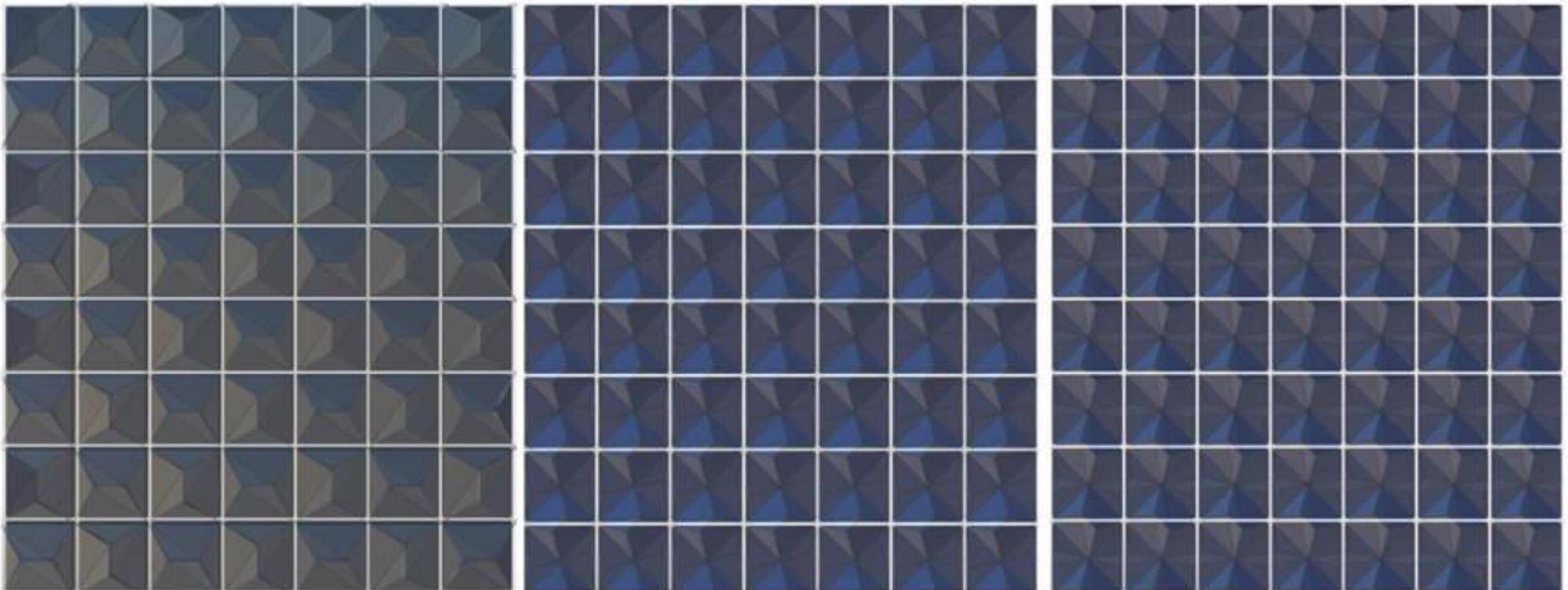


- BACK COLOR PROVIDES BASE COLORING FOR CELL LAYERS
- BACK PANEL PREFABRICATED BY GLASS PRODUCER

The Green Parameter- Construct PV, UNStudio

COMBINED ARCHITECTURAL LAYERING PATTERN SAMPLES

- GLASS FINISHING: PATTERN TRANSPARENCY/GLOSS*
- CELL PLACEMENT: EFFICIENT ORTHOGONAL*
- CELL COLOR: EFFICIENT MONOCHROME DARK BLUE*
- BACK PANEL COLORING: PATTERN BLUE TONES*



- FIRST SAMPLES CURRENTLY BEING PRODUCED

The Green Parameter- Construct PV, UNStudio

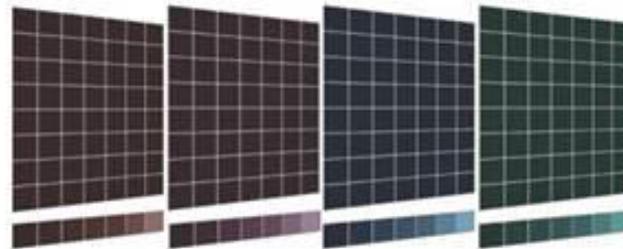
RESEARCH CONTINUES UNTIL 2016:

- GOAL IS TO PROVIDE PRODUCT CATALOGUE FOR EUROPEAN MARKET
- KNOWLEDGE USED FOR DEVELOPMENT OF PV PRODUCTION LINES

PROPOSED CATALOGUE OPTIONS:

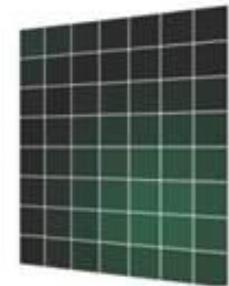
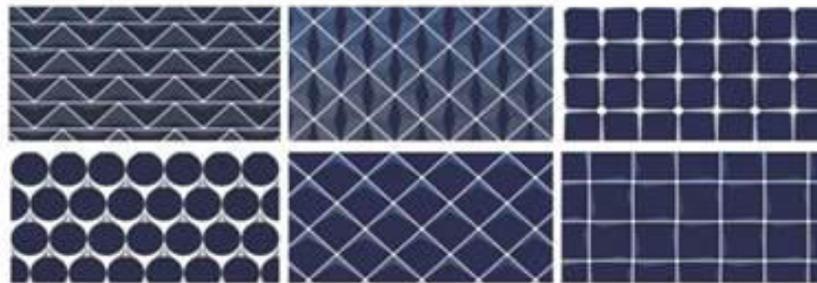
BASIC PANEL:

- RANGE OF STANDARD SIZES
- EFFICIENT CELL PLACEMENT
- RANGE OF COLORS AVAILABLE
- 1 CELL COLOR CHOICE



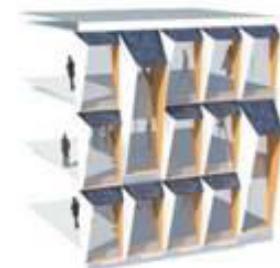
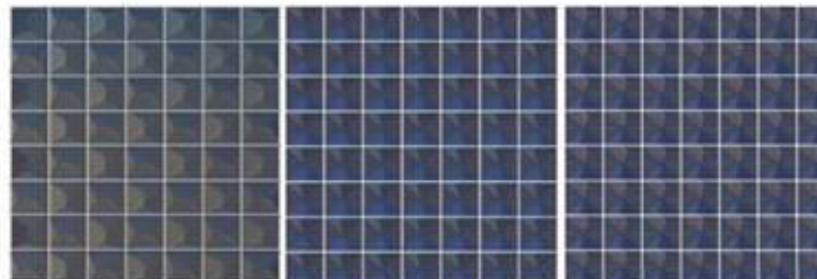
CATALOGUE PANEL:

- RANGE OF STANDARD SIZES
- EFFICIENT CELL PLACEMENT OPTIONS (ORTHOGONAL)
- RANGE OF COLORS AVAILABLE
- GLOSS/FRIT FINISHING AVAILABLE
- BACK PANEL COLORING AVAILABLE

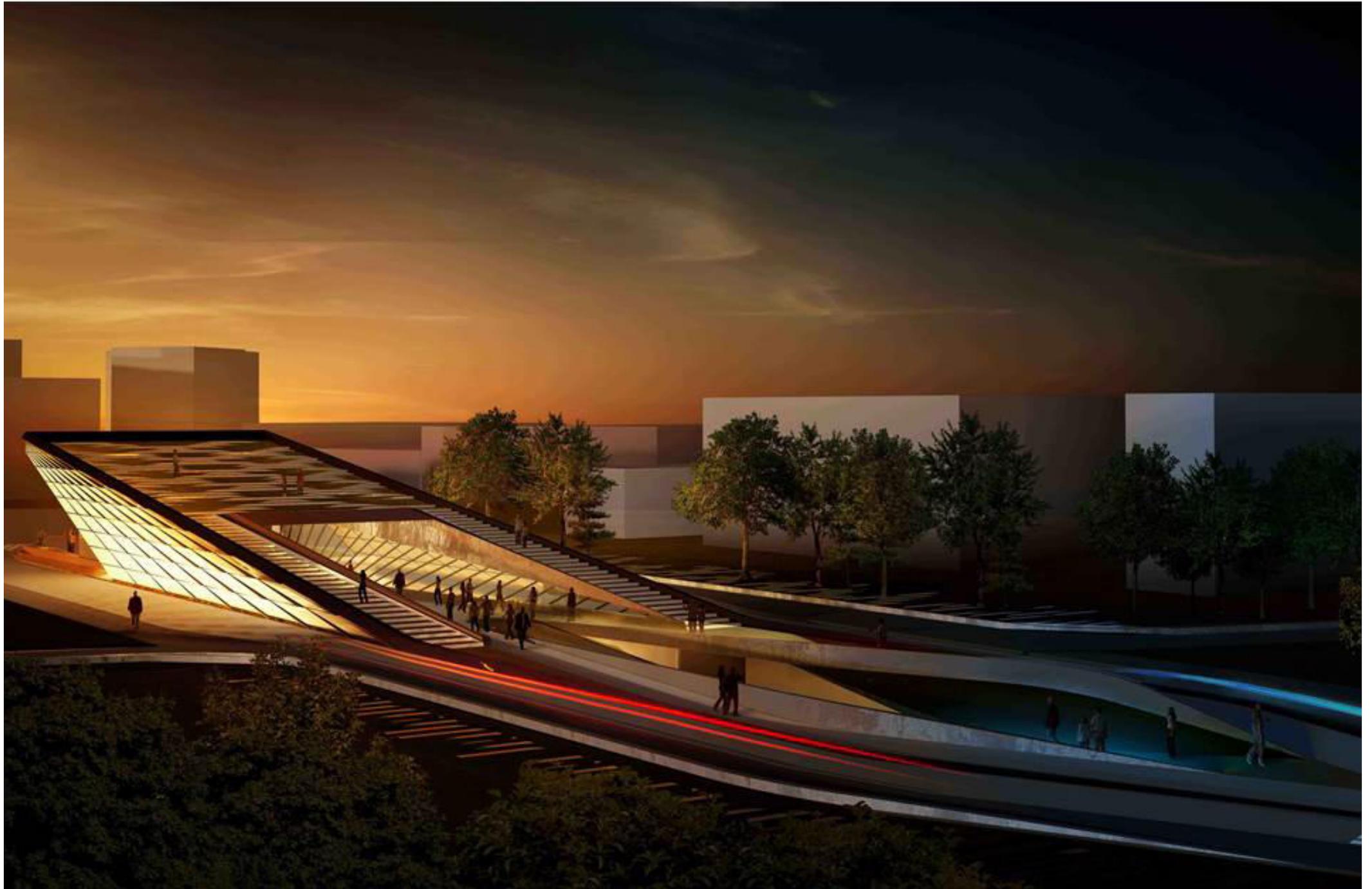


PREMIUM DESIGN PANEL:

- CUSTOM SIZES
- ALL CELL PLACEMENTS POSSIBLE
- CUSTOM DESIGN ON CELL COLOR
- CUSTOM DESIGN ON GLOSS/FRIT FINISHING
- CUSTOM DESIGN ON BACK PANEL COLORING
- CUSTOM DESIGN OF FRAME OF PV MODULE

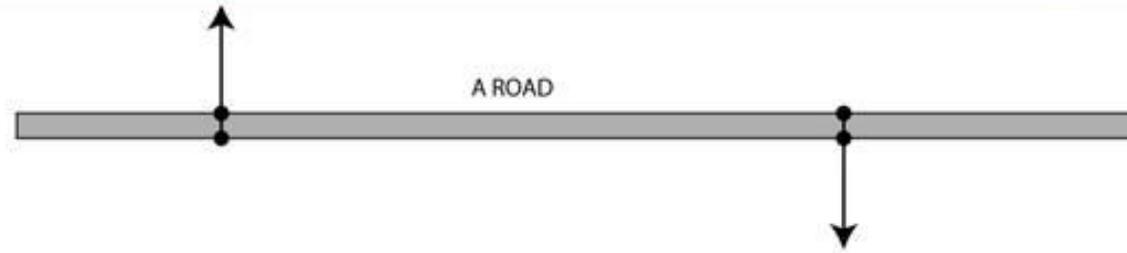


The Green Parameter- The lantern, MaDG Studio

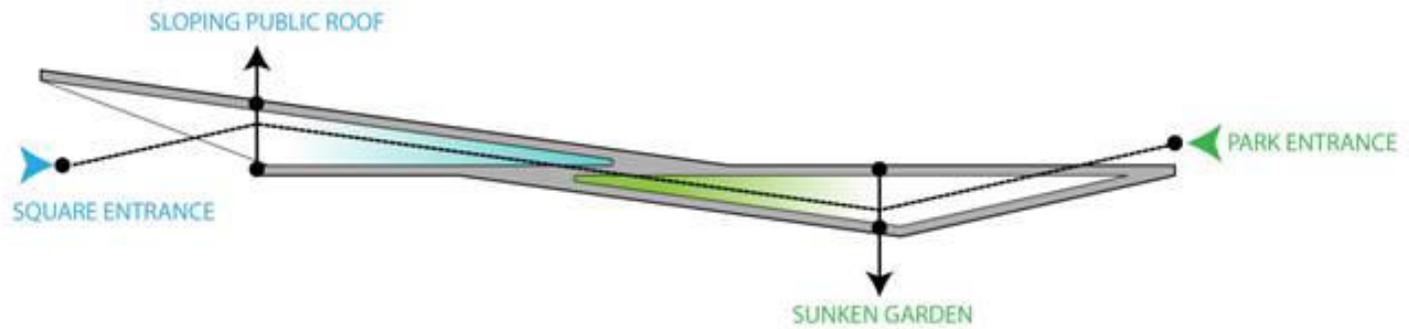


The Green Parameter- The lantern, MaDG Studio

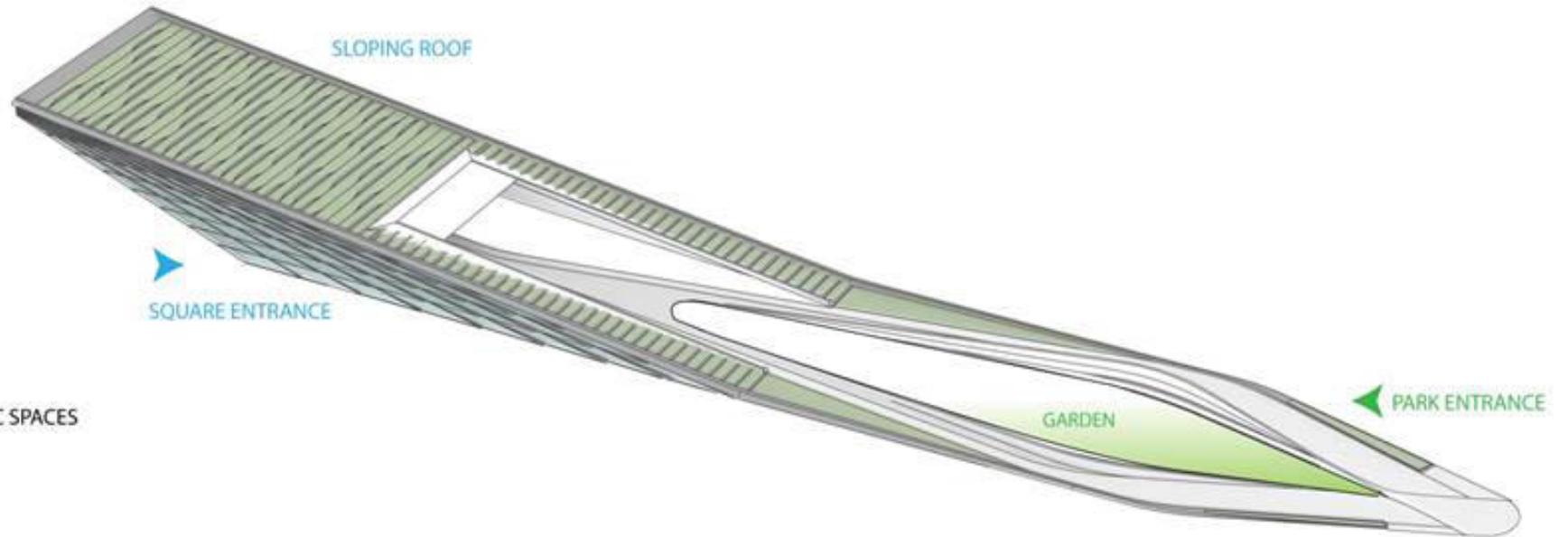
STEP 1 -
A ROAD IS JUST A ROAD



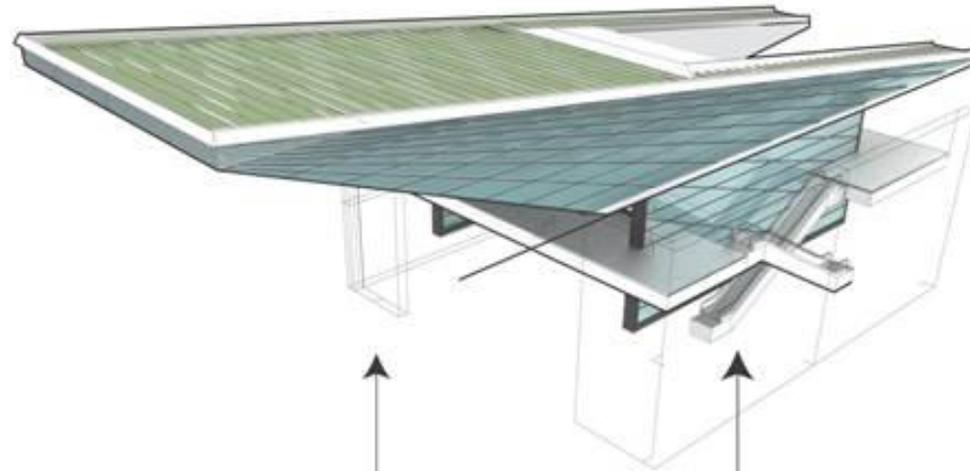
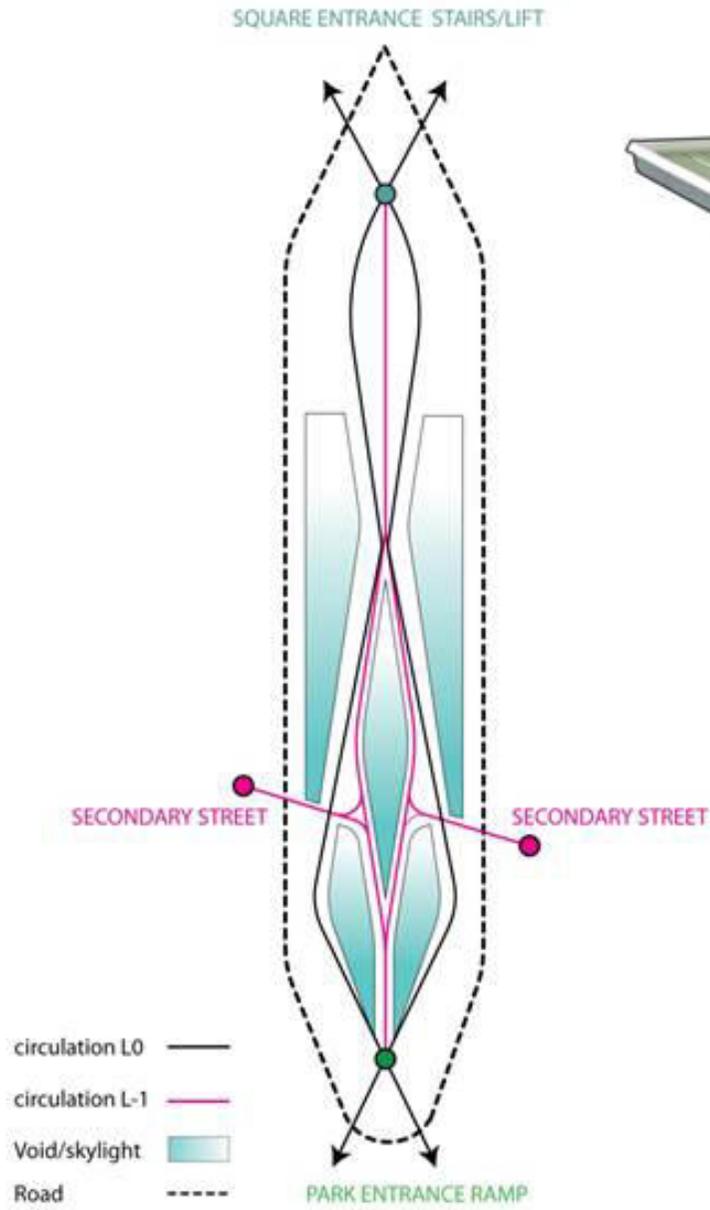
STEP 2 - 2 SIDES
2 ENTRANCES / 2 ATMOSPHERES



STEP 3 -
A STATION AS A SERIES OF PUBLIC SPACES



The Green Parameter- The lantern, MaDG Studio



Artificial Light
'Light' as a public attractor

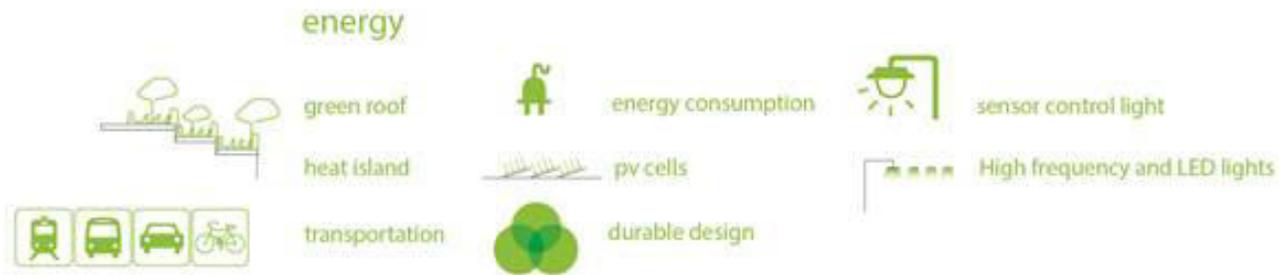
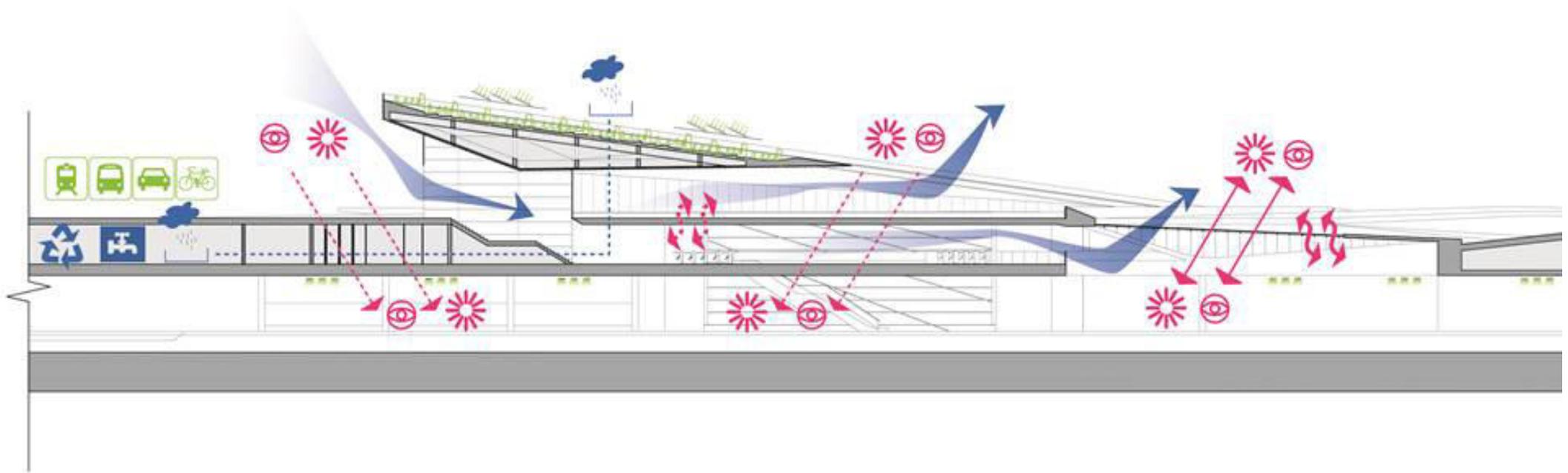


Artificial Light
Back-lit [mood] wall' as an internal orientation tool.

The Green Parameter- The lantern, MaDG Studio



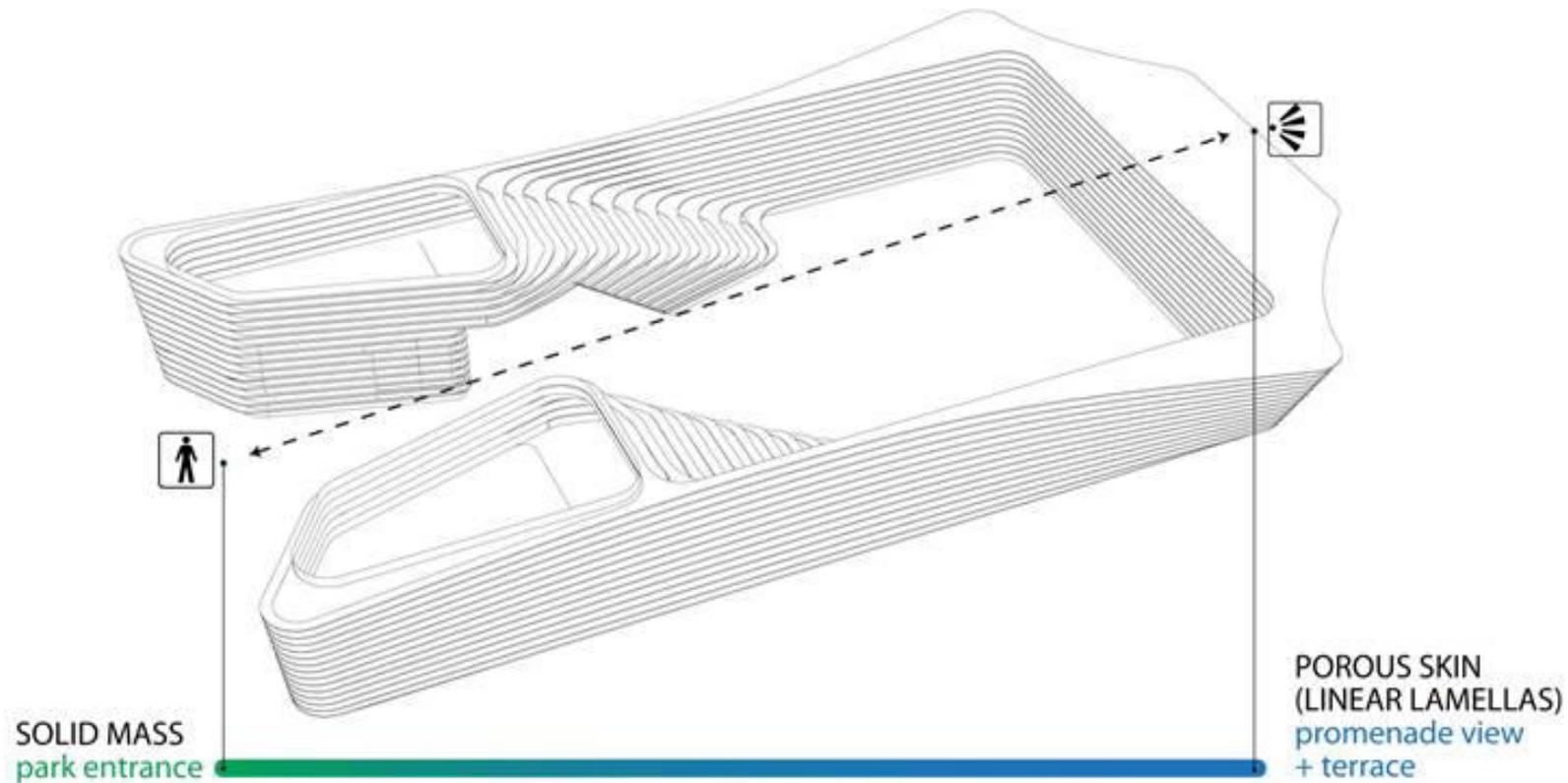
The Green Parameter- The lantern, MaDG Studio



The Green Parameter- Mist Pavilion, MaDG Studio



The Green Parameter- Mist Pavilion, MaDG Studio



park entrance - event space



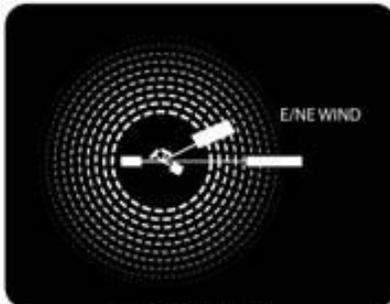
building as public activator
anchor on promenade



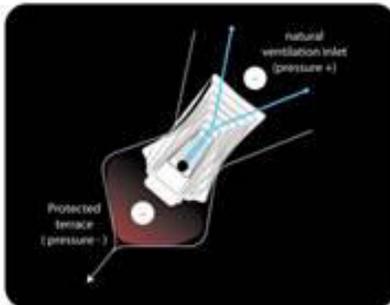
HK skyline vista
(form inside space)

The Green Parameter- Mist Pavilion, MaDG Studio

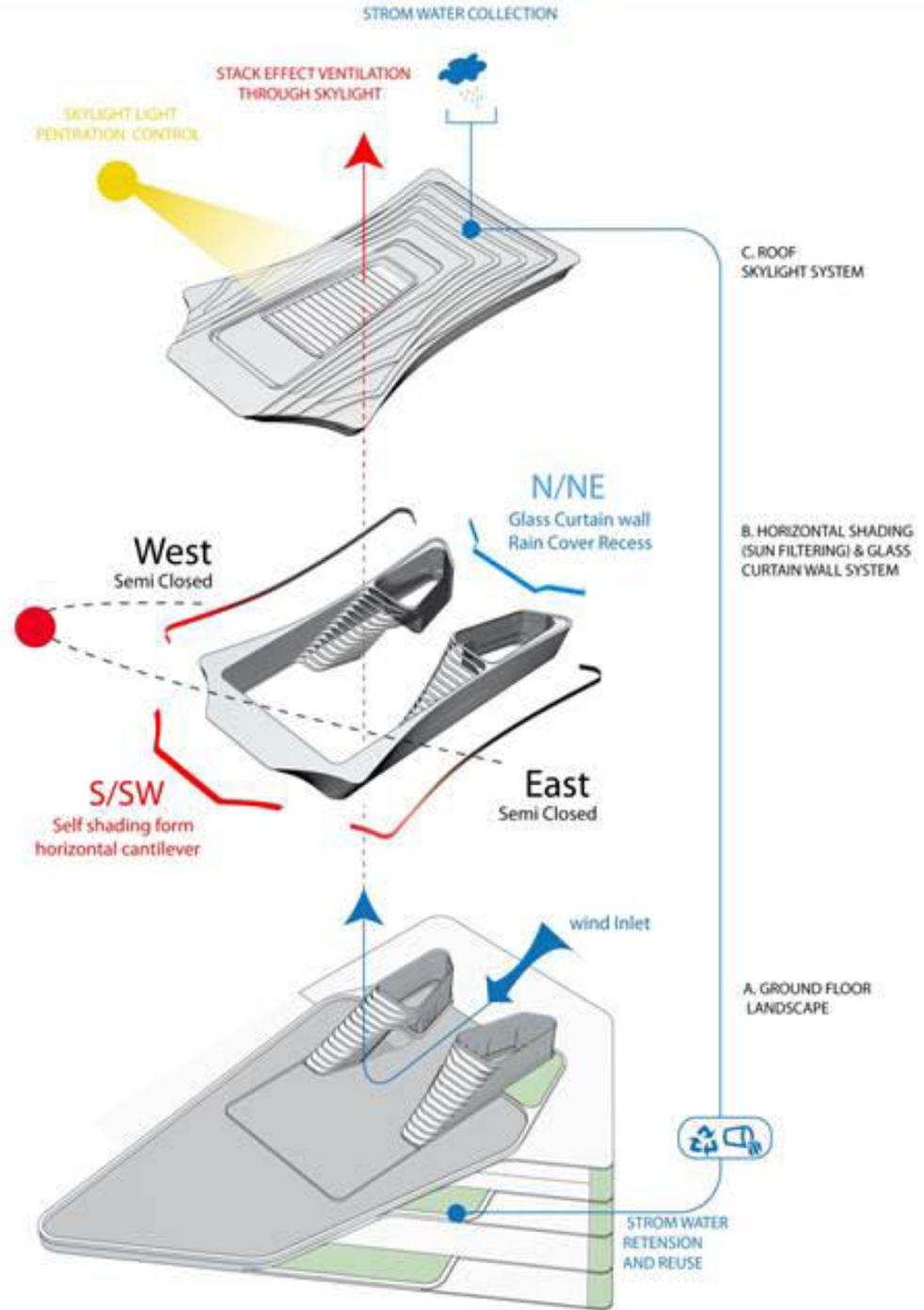
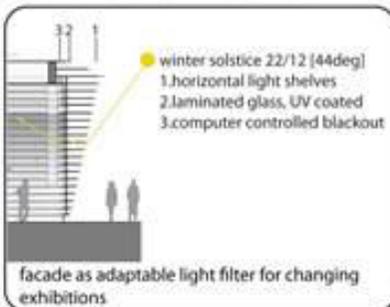
- 
SKYLIGHT- eliminates direct sunlight penetration into exhibition space
 Insulated double glazed glass with low E-coating+ Automatic controlled louvers moderating natural light level in space
- 
RAINWATER HARVESTING
 Harvesting -filtration layers connected to water storage facilities under terrace.
 Water is stored and used for surrounding landscape.
- 
NATURAL VENTILATION
 + Stack Effect + Wind protection
- 
SOLAR SHADING - A layered facade act as a light filter ,shifting in depth and degree of openness , responding to orientation needs.



WIND DIAGRAM , HK



Wind Protection in external exhibition
 Natural Ventilation in internal exhibition

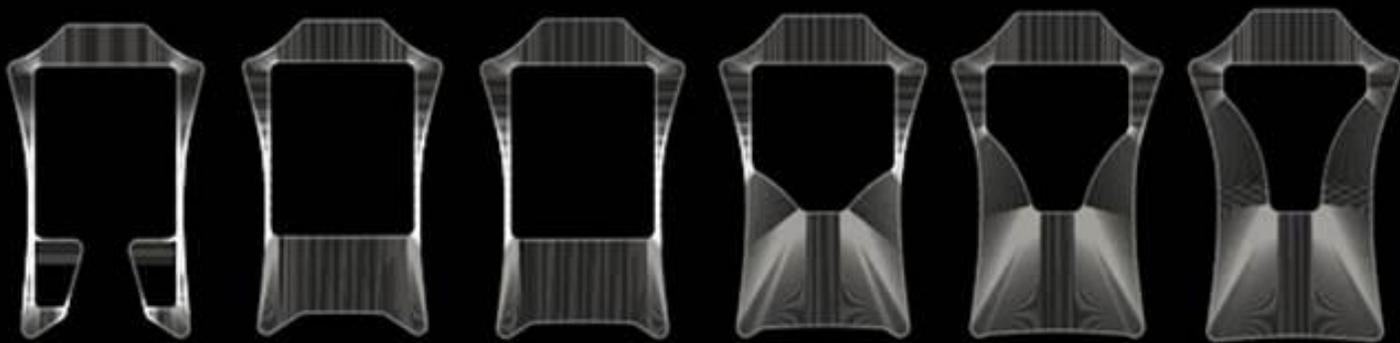




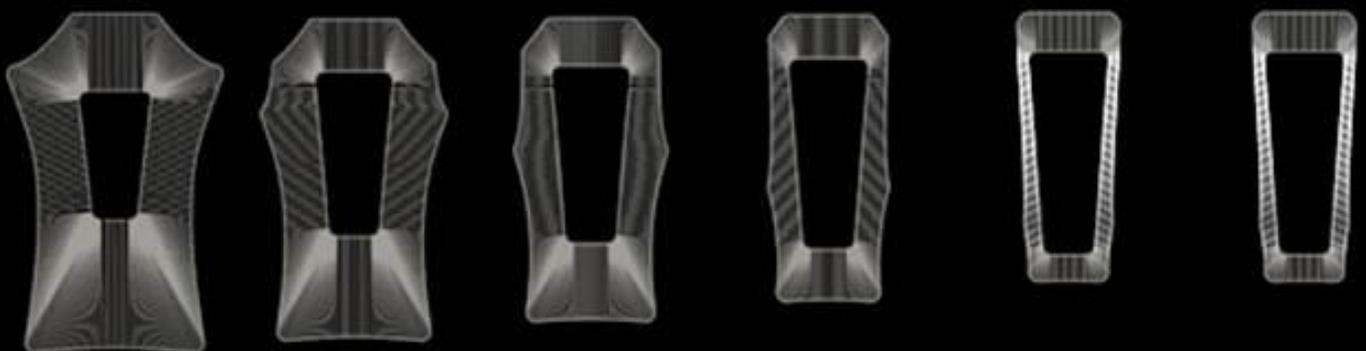
HS01 HS02 HS03 HS04 HS05 HS06



HS07 HS08 HS09 HS10 HS11 HS12



HS13 HS14 HS15 HS16 HS17 HS18



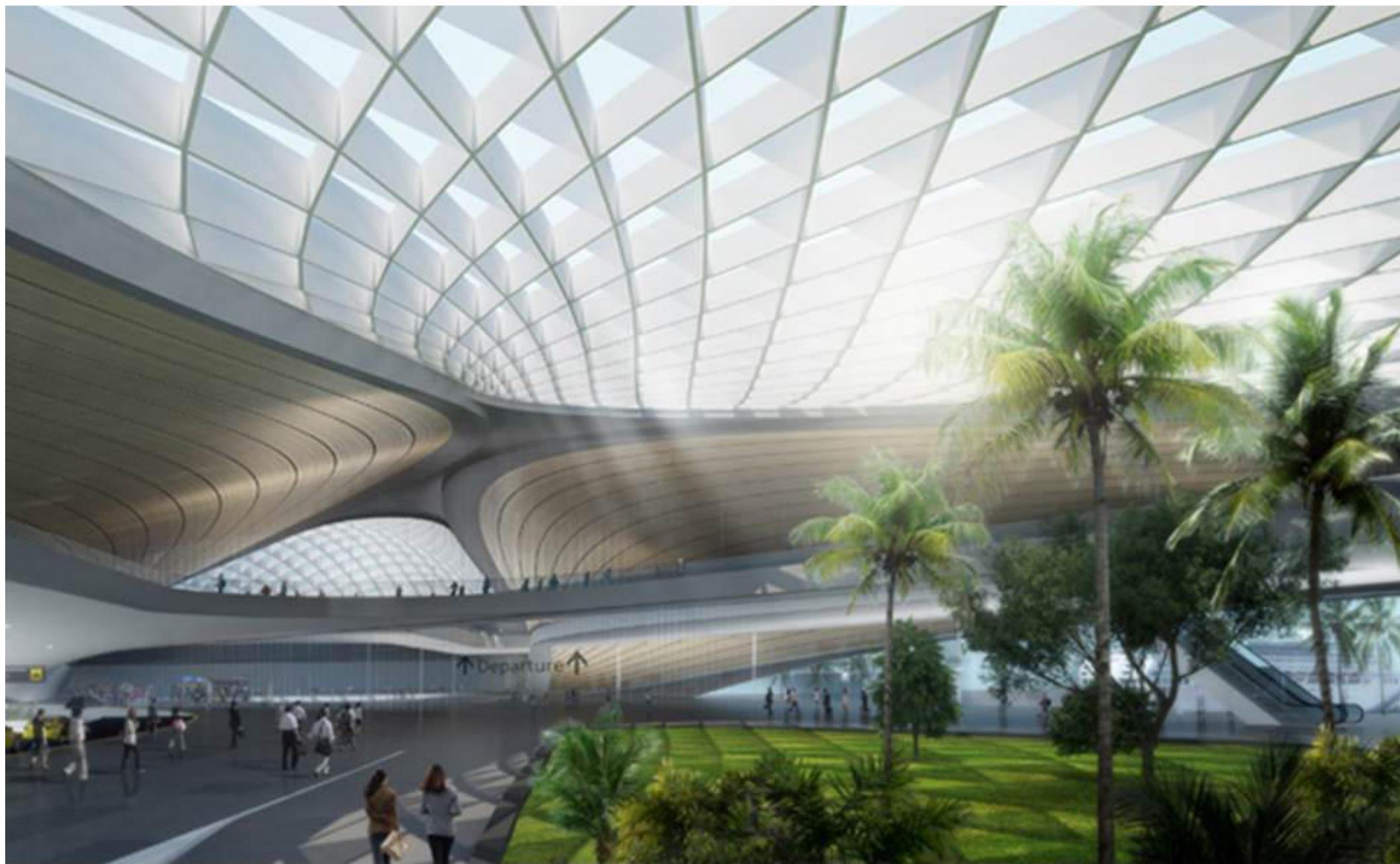
HS19 HS20 HS21 HS22 HS23 HS24



The Green Parameter- Mist Pavilion, MaDG Studio



The Green Parameter- Port of Kinmen, MaDG Studio



The Green Parameter- Port of Kinmen, MaDG Studio



The Green Parameter

verso un utilizzo della sostenibilità come parametro integrativo alla progettazione

Dove vengono inseriti alcuni parametri nel processo progettuale oggi?

Come includere alcuni parametri fin dalle prime fasi progettuali?

Perché includere questi parametri?

Cosa vuol dire includere questi parametri oggi?

Approccio progettuale e sostenibilità a confronto: il ruolo dell'architettura.