Empereal
Energizing communities

EXPERTS IN SOLAR PHOTOVOLTAIC, SOLAR THERMAL, SOLAR DESALINATION & ARCHITECTURAL BIPV

COMPANY PROFILE

www.empereal.com

ABOUT US

Experts in Solar Photovoltaic, Solar Thermal, Solar Desalination & Architectural BIPV

Empereal provides innovative and sustainable power and water solutions for a “Climate Change Impacted” world.

Headquartered in Singapore, with operations and projects in India, the Middle East, and the U.S.A, Empereal focuses on research, development, design, and implementation of innovative power and water solutions.

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OUR FOCUS

POWER

Maximise generation of low-cost, reliable solar energy

WATER

Sustainable desalination using solar power

BUILDINGS

Realise the Net Zero Vision, Turn the entire outer skin of buildings to be active and energy generating

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EMPEREAL IN FIGURES

13

Years of experience in clean energy and pure water solutions

620+MW

Of Solar projects commissioned

170+

Projects completed across India and the Middle East

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OUR PRODUCTS & SOLUTION RANGE

Architectural Solar Solutions

Large Scale Industrial

Standard Rooftops & Car Parks

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ARCHITECTURAL SOLAR SOLUTIONS

Reliable Partner To Enable Your Sustainable Projects

Emperial fills a gap in the market by providing **360° support** to make the most ambitious architectural projects come to life.

We provide parametric design services, accurate **energy generation simulations** and techno-commercial **feasibility studies** and we ensure that architectural intent is delivered in the most **efficient**, **cost-effective** and **sustainable** way through our best in class engineering and Installation services.

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About Our Partner
Mitrex

Mitrex is a Canadian company that envisions a world where solar energy is generated by any surface touched by the sun. Mitrex has developed ways for aesthetic solar panels to be directly integrated into building facades.

Mitrex is the largest BIPV manufacturer in the world

Their revolutionary building-integrated photovoltaic (BIPV) systems offer architects, engineers, building owners, and investors the opportunity to embrace and profit from solar energy without compromising beauty.

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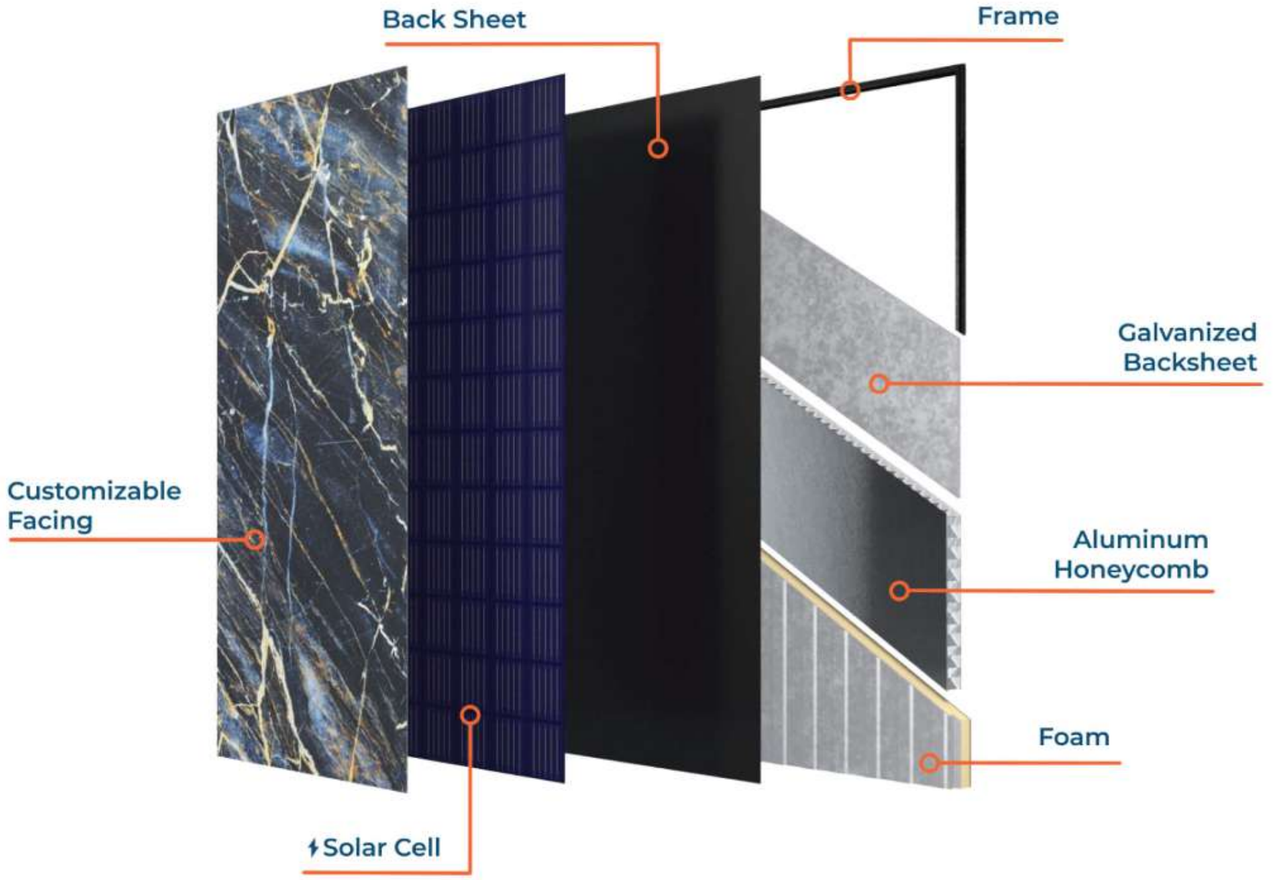
Solar Facades and cladding

- Producing clean electricity from aesthetic and durable facades
- Aesthetic, Light weight and high strength solar modules
- Various backing materials – Aluminum Honeycomb, Galvanised backsheet or Foam
- Thermal resistance and exterior noise control are added advantages

Mitrex Solar Facade Layers



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MITREX
BUILDING-INTEGRATED SOLAR TECHNOLOGY

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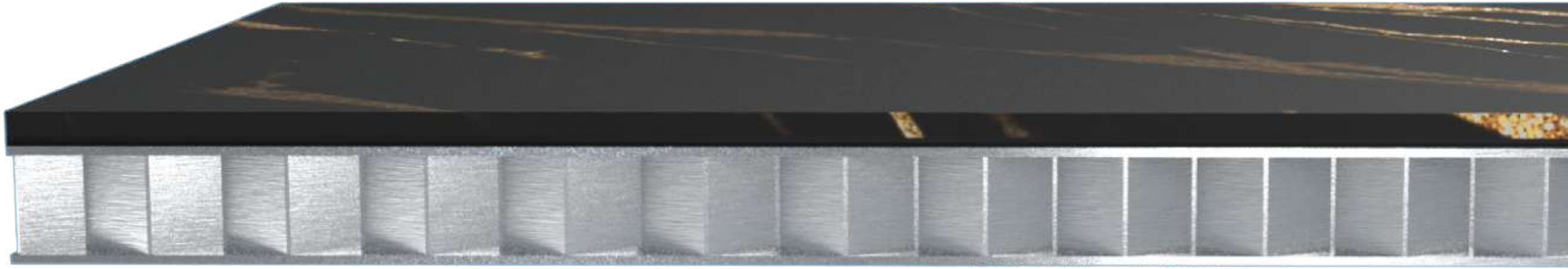
Solar Facades and cladding

Mitrex cladding panels are an energy-efficient solution for both existing and new facades. Particularly from design and building perspectives, Mitrex BIPV systems have limitless applications.

Mitrex panels transform typical, single-purpose building materials into multi-purpose cladding that acts as an energy generating building envelope.



ARCHITECTURAL SOLAR SOLUTIONS

Fully Customizable Designs & Patterns

The adoption of solar panels as BIPVs (Building-Integrated Photovoltaics) or BAPVs (Building-Applied Photovoltaics) has been limited due to poor designs and limited choices. A significant advantage of Mitrex BIPV and BAPV panels is that they are entirely customizable.

Therefore, the products can achieve the look of any surface material, pattern, texture, or image desired, including granite, porcelain, brick, wood, or customized graphics.

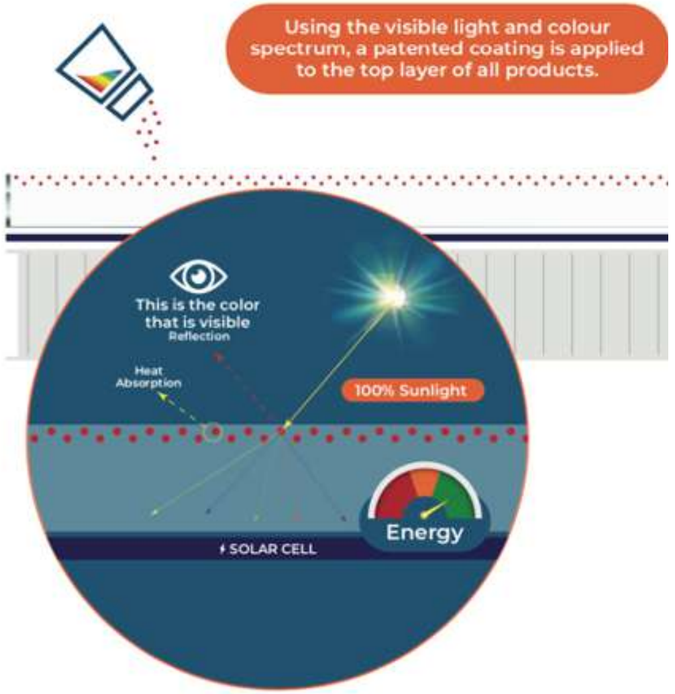
Fully Customizable Designs & Patterns

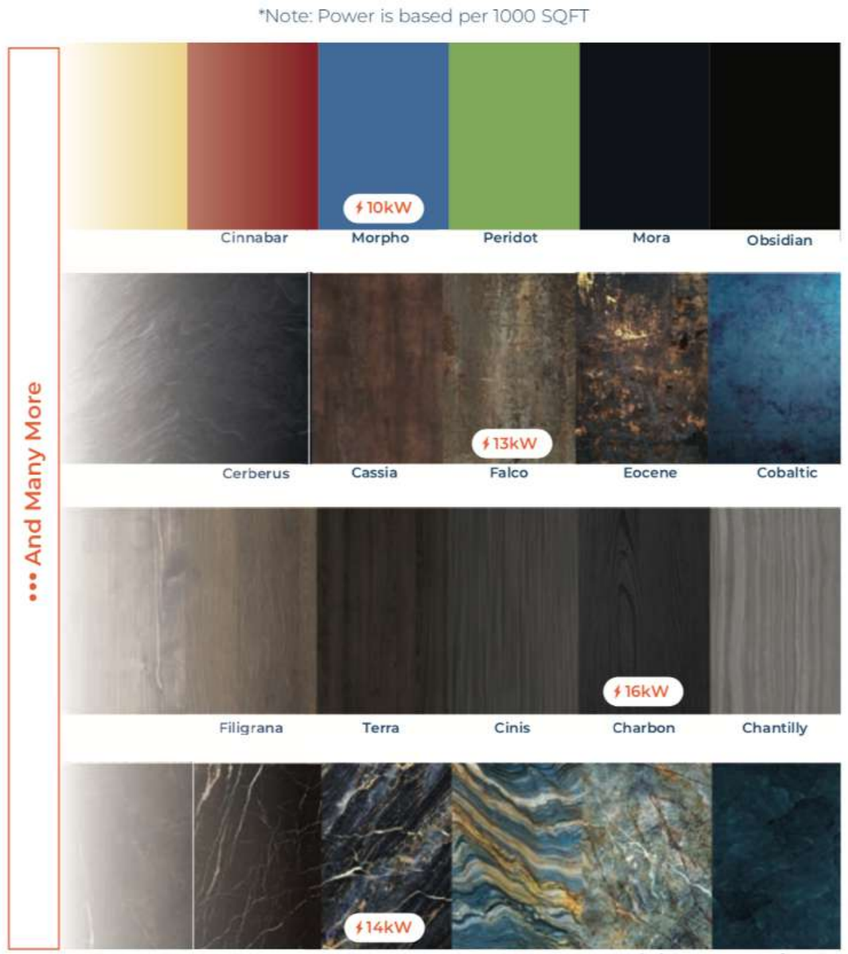
- Any finish and design can be customized for the active façade solar modules
- Compatible with curtain walls, rain screen and stick façade systems
- Fully fire rated – NFPA 285 certified, EN 13501-1 A2, S1, D0 classification
- Empereal can provide total façade solution along with energy generation simulations and feasibility studies.

- The amount of energy generated is a function of the color, design , mounting and orientation of the facade

- Block walls, spandrel sections etc are high generation areas

- Vision sections can be addressed by special arrangements of solar cells





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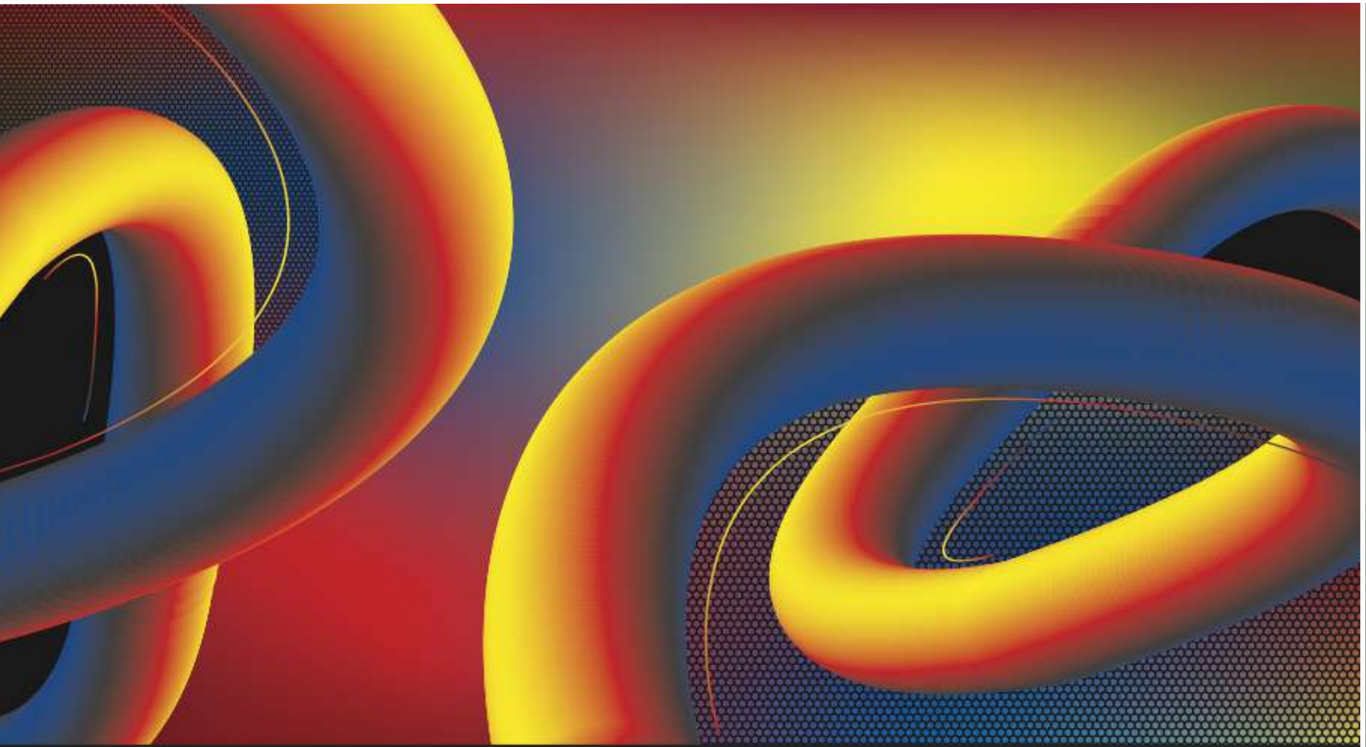
ARCHITECTURAL SOLAR SOLUTIONS



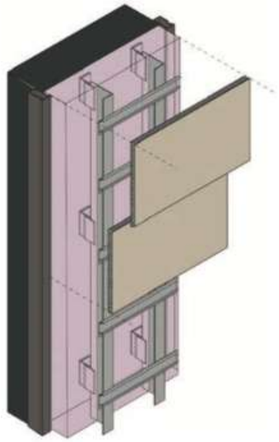



Aesthetic active solar facades

- Customization makes every façade a candidate to be an active solar façade

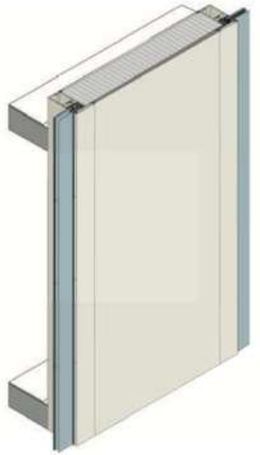
- Solar cladding works with various types of façade systems

System Options:

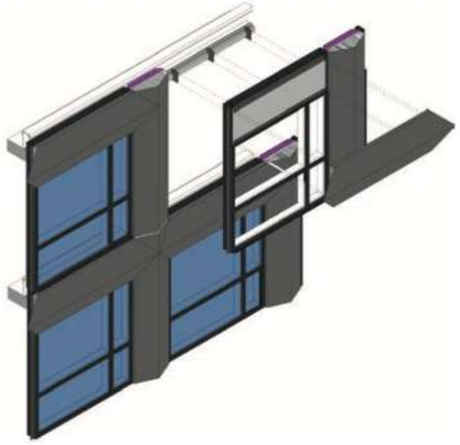


RAINSCREEN SYSTEM

Stick-Build & Pre-Assembled



PRE-FAB WALL SYSTEM



UNITIZED FACADE SYSTEM

Integration to Other Assemblies

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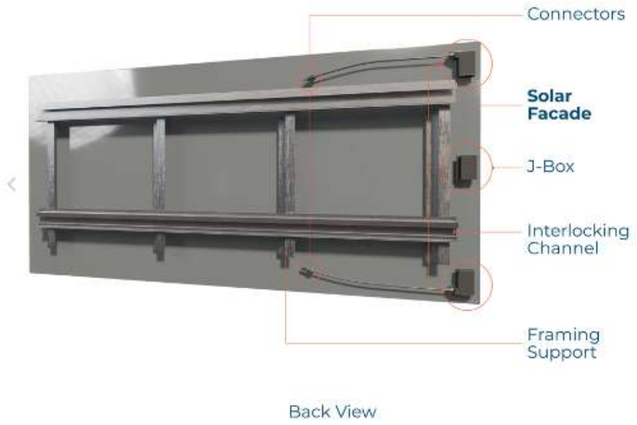
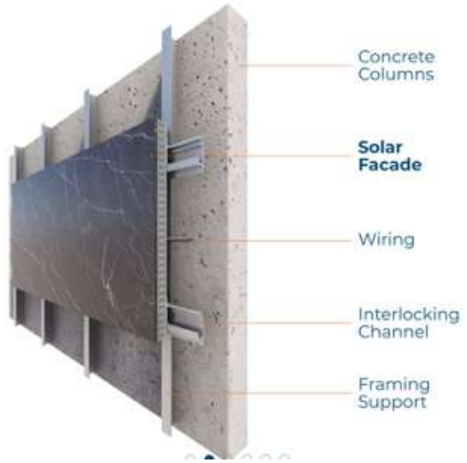
Aesthetic Active Solar Facades – Compatible With All Types of Façade Systems

Factory Bond System

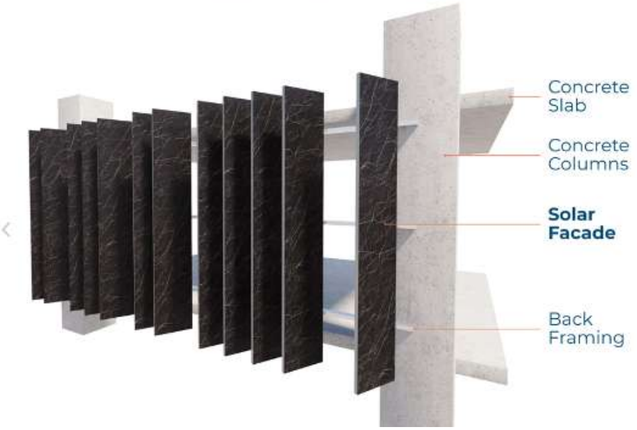


Interlocking Channel System

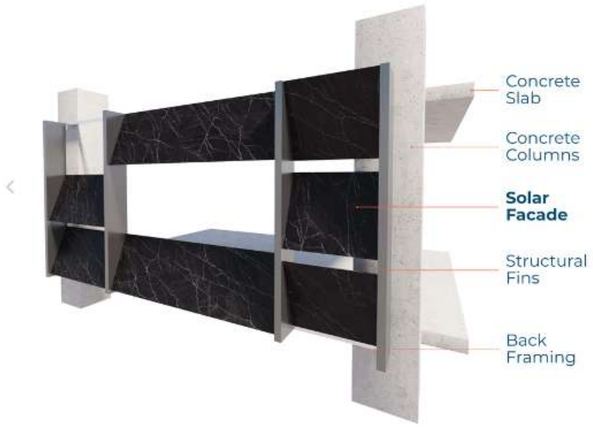


Pre-Panelized / Slab to Slab System

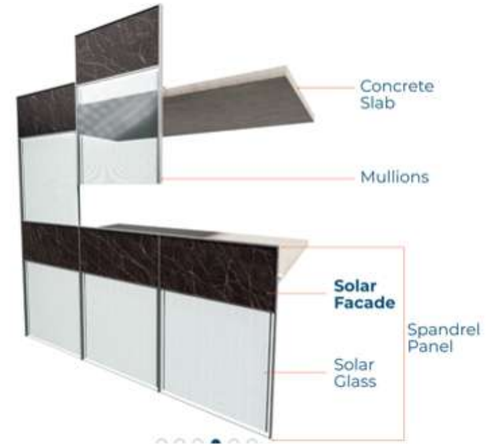
Custom Attachment System



Custom Attachment System



Unitized Facade System



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Solar Facades – Sample projects

59 kWp – Industrial retrofit 400 SqM

280 kWp Govt Building retrofit 1000 SqM

20 kWp New Building 150 Sq Mtrs

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Solar Facades – Retrofit Project

- Existing facades can be retrofit to provide renewed aesthetics and energy generation

- Generate cheaper solar electricity and convert buildings to sustainable green certified buildings

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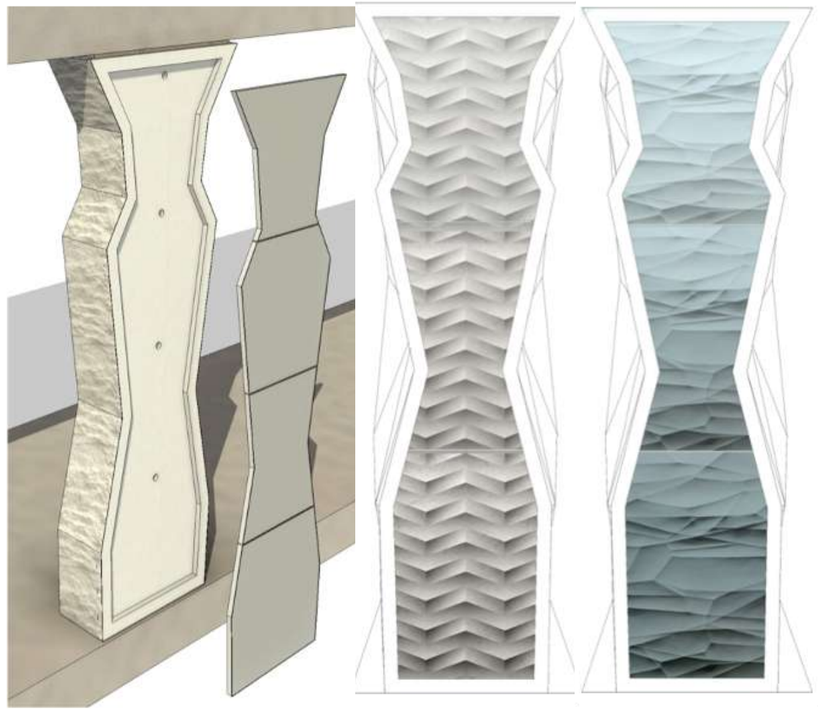
Aesthetic Solar Facades:

New design project

Custom solar facades can be used to enhance architectural design and convert buildings to Net Zero sustainability credentials



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Solar Railing

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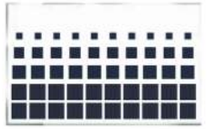
Solar Glass

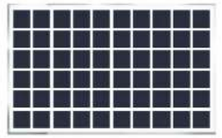
DESIGN

Transparent
Transparent Technology

Semi-Transparent
Monocrystalline Solar Cell



Transitional
Monocrystalline Solar Cell



Semi-Opaque
Monocrystalline Solar Cell

Opaque
Monocrystalline Solar Cell

SYSTEMS

Laminated Glass

Insulated Glass Unit (IGU)

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Solar Railings – Sample projects

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Solar Roof

DESIGN

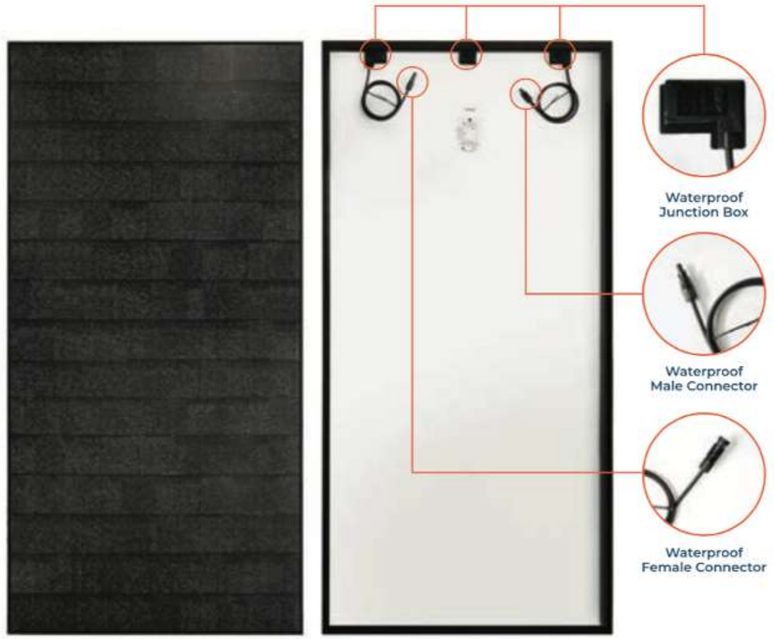

Black Asphalt


Grey Asphalt


Brown Asphalt


Black Slate

COMPONENTS



INSTALLATION

Ultralight Flexible Solar Panels

TSO's range of products changes the vision on how solar energy can be deployed on any surface

Transform any surface into a renewable electricity generator

Lightweight TSO Flexible modules provides savings in supporting structures and installation time.

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FLEXIBLE SOLAR PANELS

Lightweight Flexible Solar Panel For Specific Applications

Lightweight Flexible solar panels can be used on curved surfaces and a variety of surfaces

Easy installation on surfaces

2mm thickness with a weight of approximately 3.5 Kg/ Sq mtr

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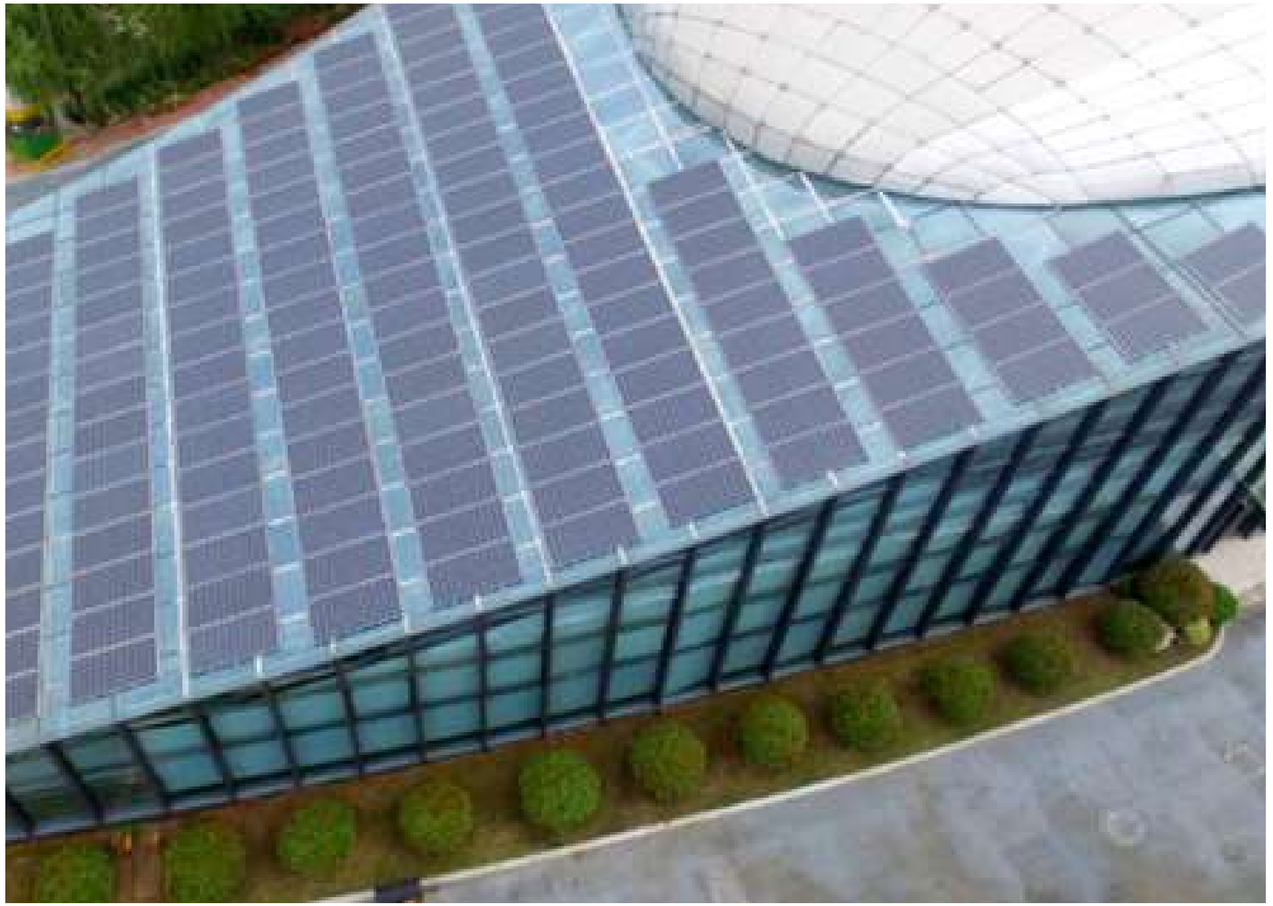
FLEXIBLE SOLAR PANELS

Curved Canopies

Glass roofs and facades



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FLEXIBLE SOLAR PANELS

Water-proofed membrane roofs

Low load bearing roofs

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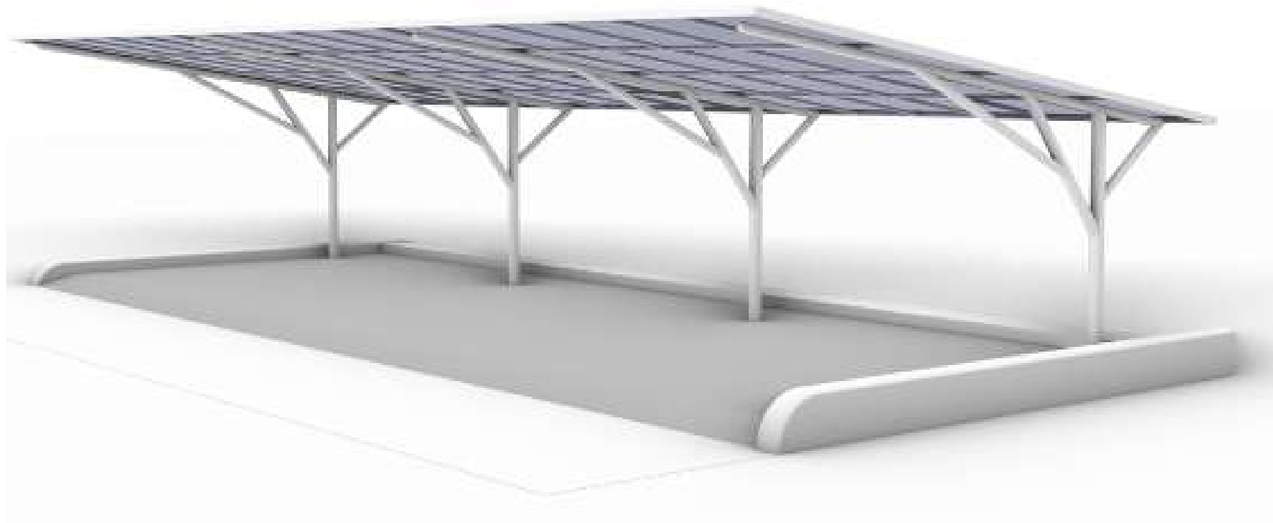
FLEXIBLE SOLAR PANELS

Solar Carport

TSO engineering team has designed a new concept of solar flexible carport. The low weight of the TSO´s flexible solar modules (approximately 3 kg/m2) allows the necessary structure to be much lighter compared to that required by any other conventional solar module.

In addition, due to its flexibility, the panels will be adjusted perfectly to the curved shape of the carport improving the aesthetics.



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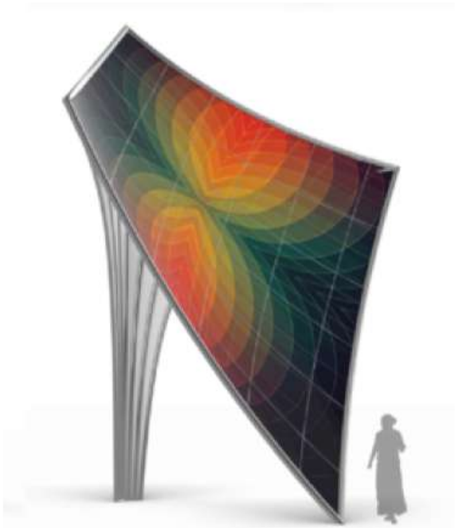
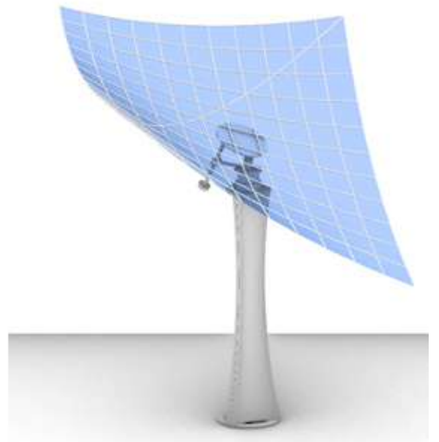
FLEXIBLE SOLAR PANELS

Architectural Solar structures for public spaces

- Solar Tree/ Solar Sails / Public shade structures
- Aesthetic sustainable structures to be used in public spaces, parks, iconic buildings, corporate HQ etc
- Can have Single/Dual Axis tracking for high efficiency – 5KWp
- Can be integrated with storage for public lighting, entertainment systems, security cameras etc

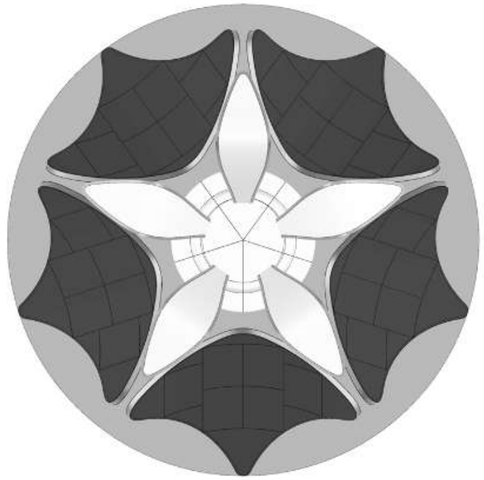


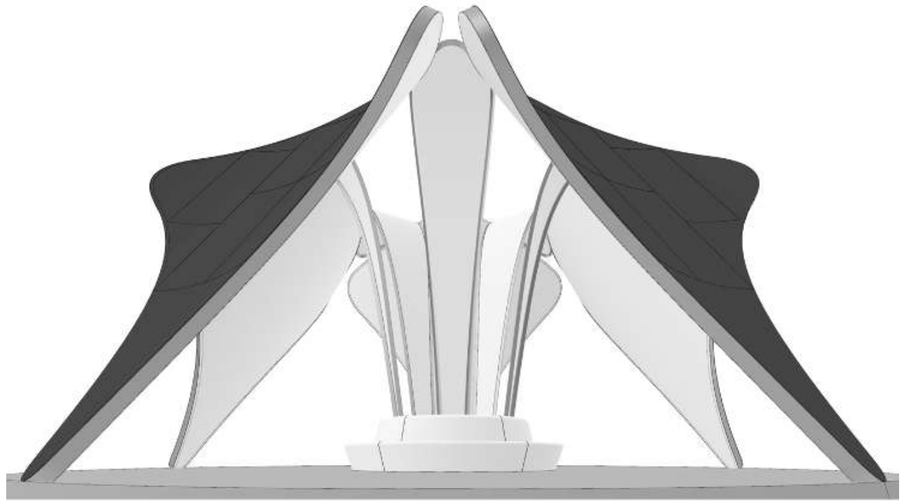


FLEXIBLE SOLAR PANELS

Public Shade Structures

- Artistic canopies and shade structures using flexible solar panels
- Design and implementation of custom designed structures
- Multi functional units to provide shade and generate solar energy
- Can be integrated with energy storage for off-grid applications

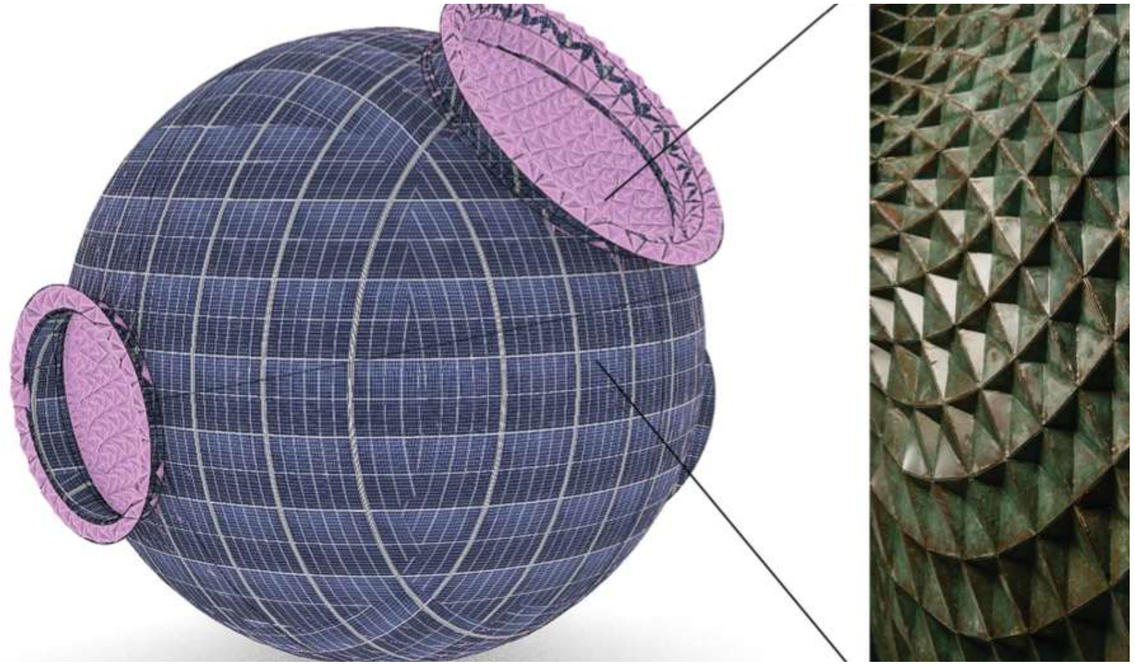




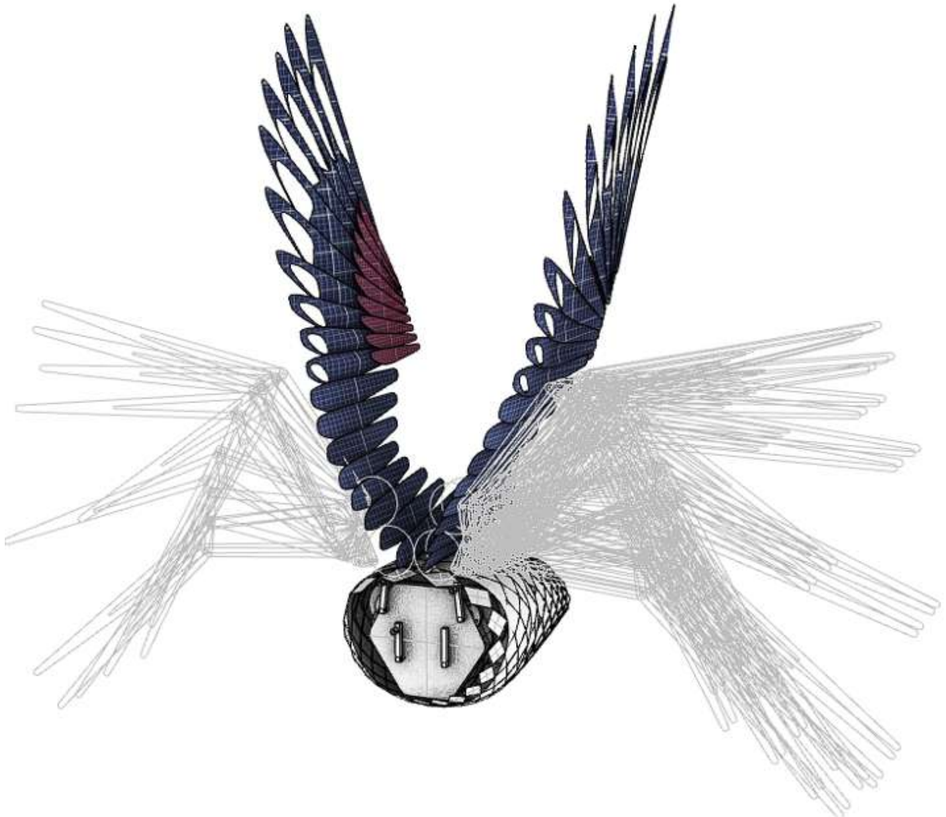
FLEXIBLE SOLAR PANELS

Sustainable Solar-Powered Kinetic and Interactive Art Structures

Empereal is pioneering solar installations in public realms with art as the medium.



“Breathing Earth"



“Kinetic Falcon Wings"

FLEXIBLE SOLAR PANELS

EXPO 2020 PROJECT

Installed Capacity : Approx 300/97 kWp

UAE Pavilon

By Santiago Calatrava

To produce the "solar feathers" of this falcon in flight, we had to overcome several challenges:

- Complex curved wings of the falcon – cold forming of glass
- White color architecture in motion
- LEED Platinum building – complex energy simulations
- Shadows and orientation
- Parametric design for structures
- Complex energy simulation

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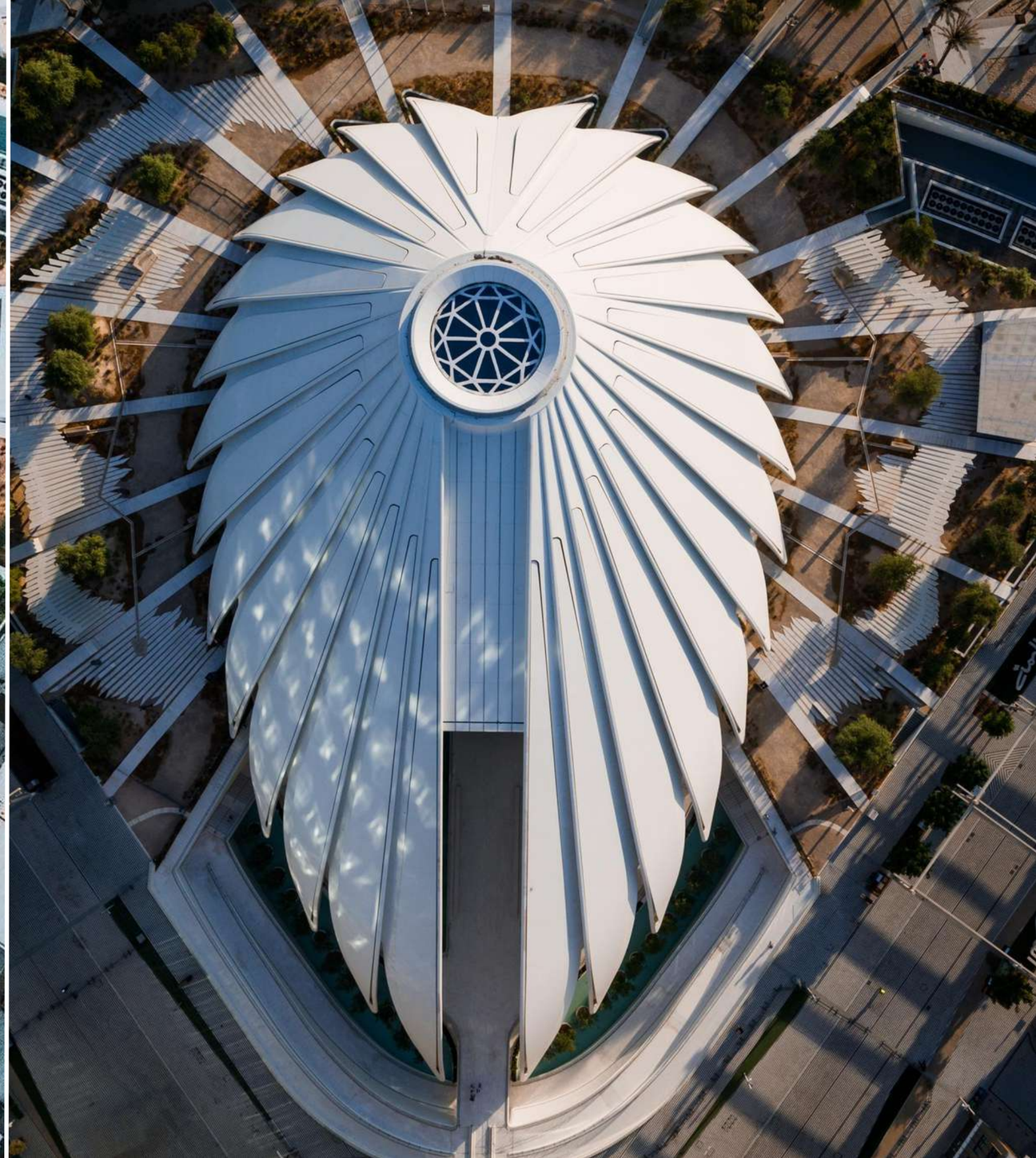
ARCHITECTURAL SOLAR SOLUTIONS

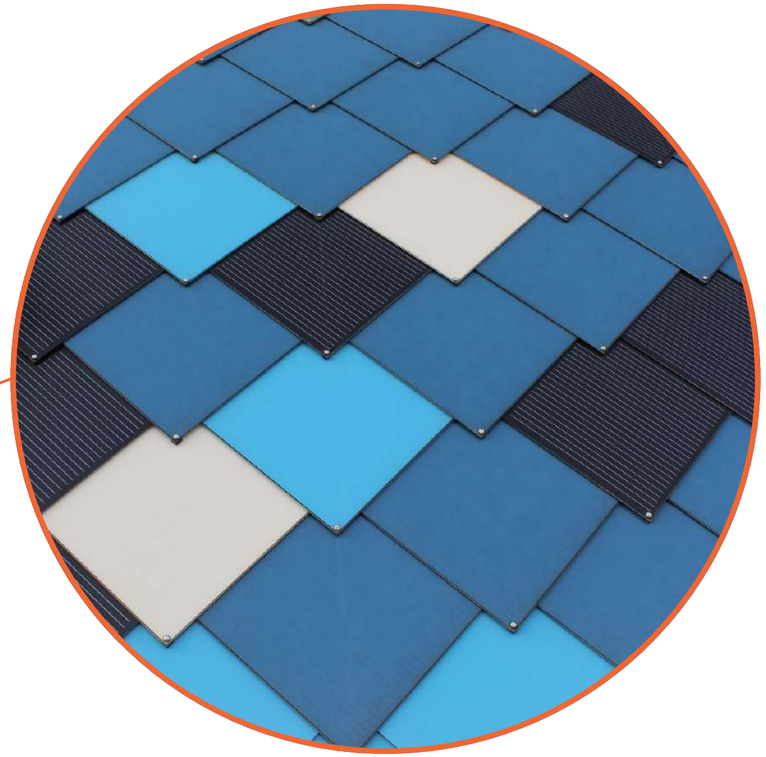



EXPO 2020 PROJECT

France Pavilon By Atelier du Prado

Recreation of Claude Monet's "Water lillies and Clouds" painting with Solar PV

Installed Capacity : 224 kWp



ARCHITECTURAL SOLAR SOLUTIONS

EXPO 2020 PROJECT

UAE Thematic Districts by Hopkins Architect

3.5M raised structure + Solar PV-LEED Gold Certified

- Opportunity District – 11 Pavilions
- Mobility District – 11 Pavilions
- Sustainability District – 11 Pavilions
- Number of Pavilions : 33

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EXPO 2020 PROJECT

Al Wasl Plaza By Adrian Smith Gordon Gill

Installed Capacity: 1 MWp

Leed Platinum Buildings with max solar generation

Solar installed on roof, podium and entrance canopy.

EXPO 2020 PROJECT

Al Wasl Plaza: Building Integrated Solar System at Entrance Canopy

Custom solar canopy; hidden wiring and invisible mounting solutions

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talabat
طلبات
KITCHEN
طلبات
Talabat Kitchen
talabat
طلبات
KITCHEN

New Masdar HQ: Dubai– 1.7 MW BIPV Net Zero Building - Ongoing

- Masdar HQ under construction in Abu Dhabi
- Parametric architecture design for the solar canopy
- Solar to generate enough electricity for Net-Zero certification of the HQ building

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AWARDS & RECOGNITIONS -MESIA 2022

Empereal Energy and Services wins the Middle East Solar Industry Association (MESIA), Commercial and Industrial Project of the year Award for 2021.

WINNER

COMMERCIAL AND INDUSTRIAL SOLAR PROJECT OF THE YEAR

MESIA

2022 CEREMONY

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AWARDS & RECOGNITIONS 2022/2023

EQ Magazine

Solar Quarter

EQ Solar Conference - Dubai

Solar Quarter - Dubai

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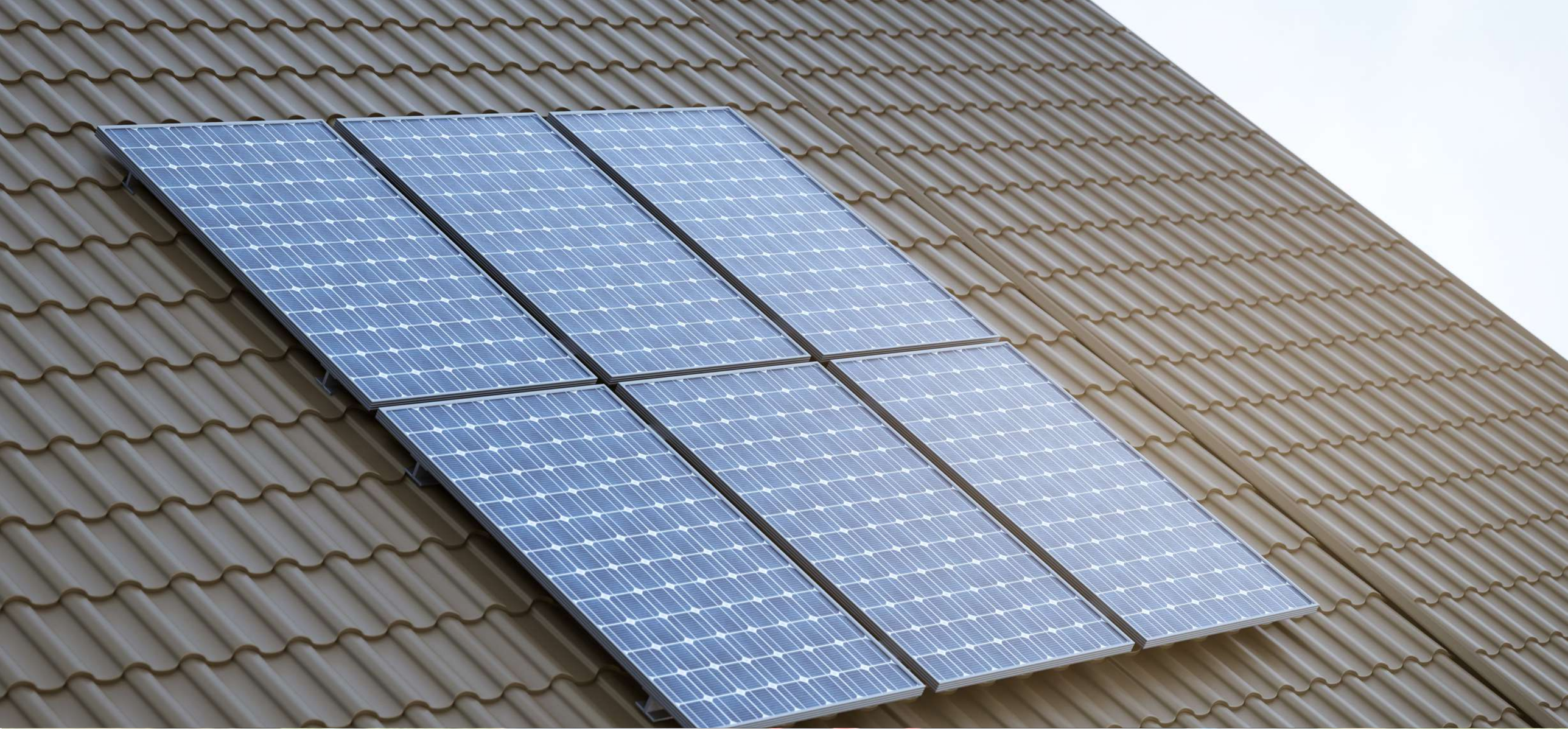

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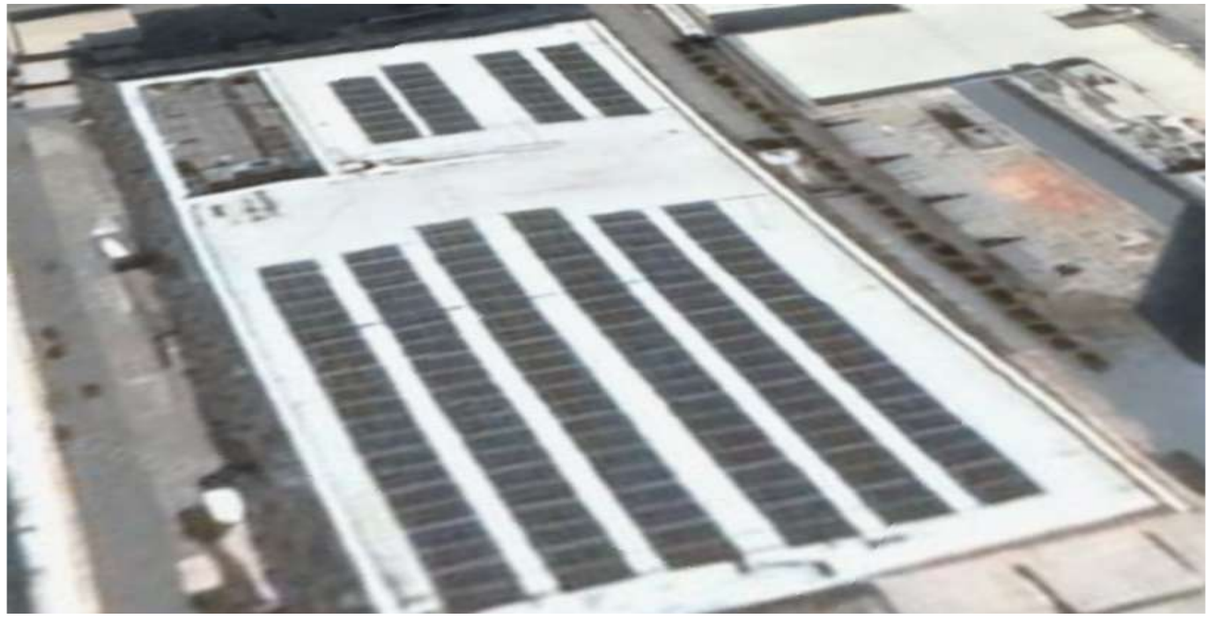
STANDARD ROOFTOPS & CAR PARKS

Indonesia Pavilion – Solar PV + Storage



Roof Top Solar + Battery Storage Solution

Installed Capacity : 90 KWp + 600 kWh storage

German Pavilion – Solar PV + Thermal

Roof top – Solar PV + Thermal panels

Warehouse – DIC Roof Top

Installed Capacity : 1 MWp

Dubai Prosecution HQ – Roof Top Car Park

Carport Structure + Solar PV design and installation

Installed Capacity : 215 KWp

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Al Tadawi Hospitals – Roof Top Solar

Structure + Solar PV design and installation

Installed Capacity : 40 KWp

Shuaiba Industrial Comoany – Roof Top Solar

Solar PV design and installation

Installed Capacity : 775 KWp

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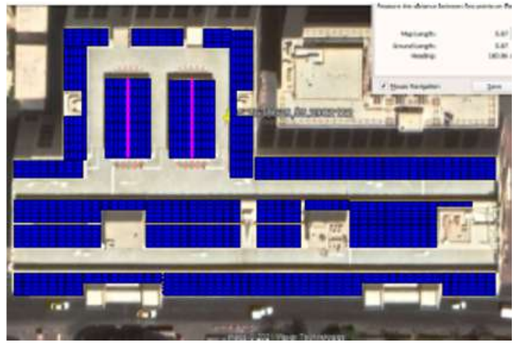
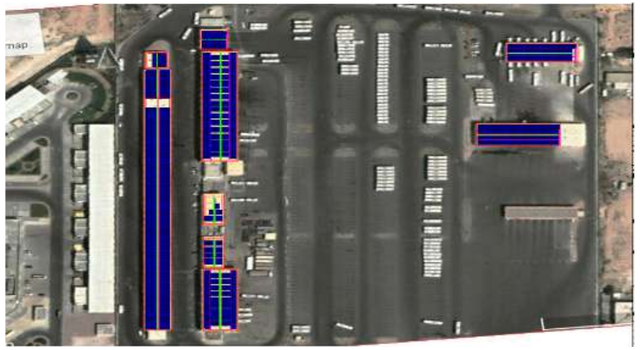
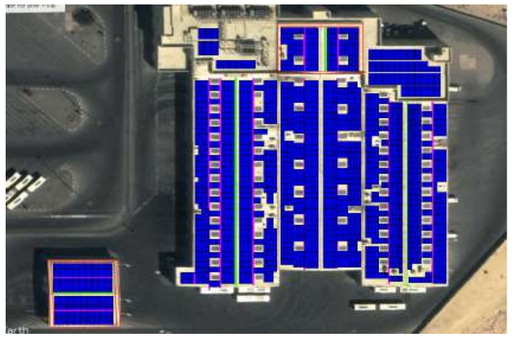
RTA Bus Tram and Metro Depots - 12 Projects -11 MW



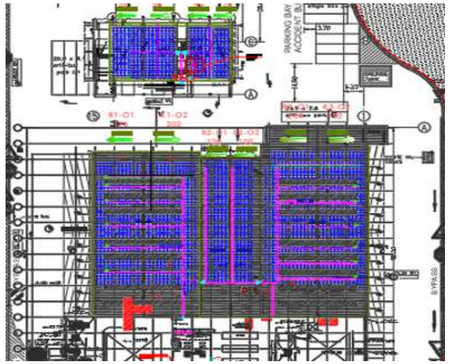
Al Gubaiba Car Park



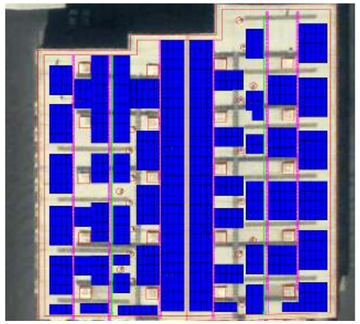
Al Awir Bus Depot



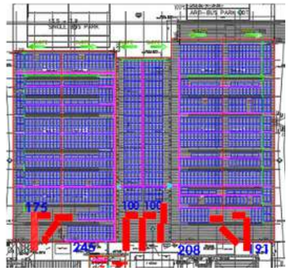
Jebal Ali Bus Depot + Accomodation



Khawaneej Bus Depot



Al Quoz Bus Depot



Al Ruwayyah Bus Depot

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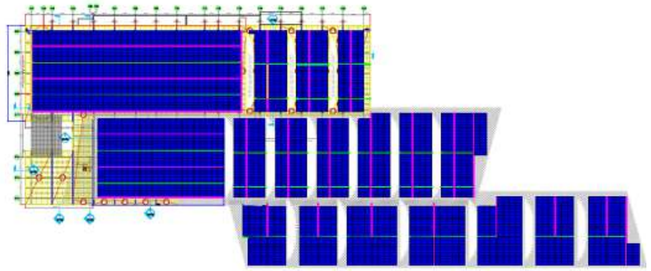
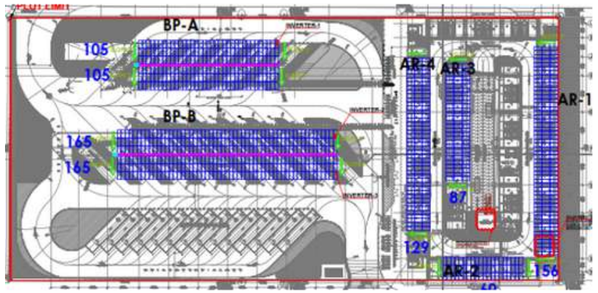
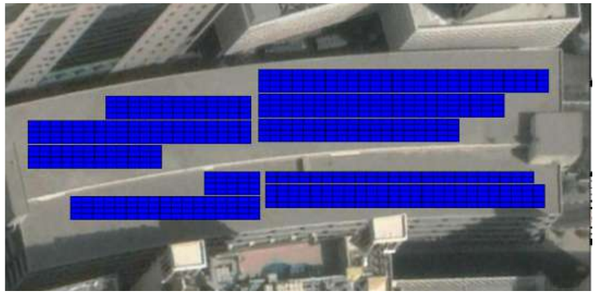
RTA Bus Tram and Metro Depots - 12 Projects -11 MW



Al Sufuoh Tram Depot

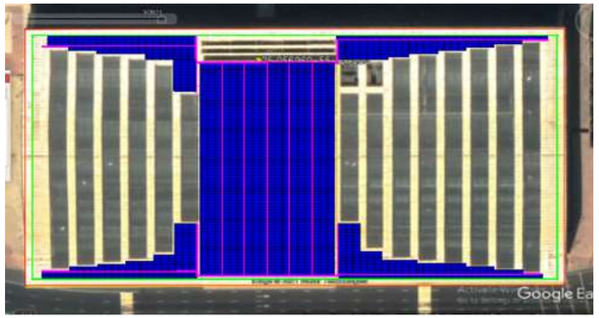


Al Satwa Bus Station

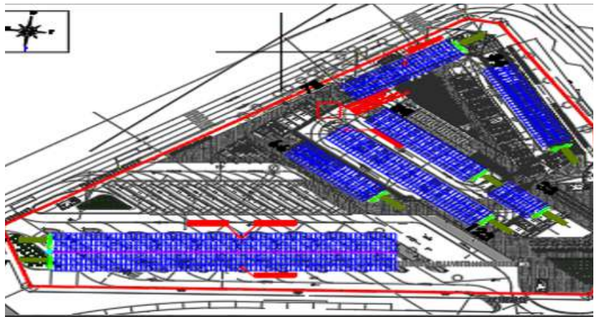


Al Rigga Car Parking

Muhaisnah
Accomodation



Metro Car Park Shed
at Nakheel Harbor



Oud Metha Bus Station

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LARGE SCALE INDUSTRIAL

Solar PV Farms & Rooftops

Bankable Utility scale PV power plants and innovative integrated architectural solar buildings

Large roof top solutions, Architectural roof and façades, Ground mounted and car port solutions

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Completed Projects: Solar PV Farms - References

32 MW, Karnataka, 2017

18 MW, Tamil Nadu, 2016

5 MW, Gujarat, 2012

3.72 MWp, IG Airport, Delhi, 2017& 2019

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LARGE SCALE INDUSTRIAL

Completed Projects: Solar PV Farms - References

3MWp, Jindal Polyfilms. 2016

2x10 MW, Gujarat, 2015

8 MW, Tamil Nadu, 2015

1MWp CutomMountKutch,Gujarat

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LARGE SCALE INDUSTRIAL

Masdar City, Abu Dhabi - Solar PV + Energy Storage

Single Axis trackers, Bifacial modules, Energy Storage and Instrumentation

Installed Capacity : 100 KWp, ESS and EMS

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LARGE SCALE INDUSTRIAL

Solar Thermal Solutions (CSP)

Continuous production of power using Solar Thermal & Thermal storage, suitable for any steam/heat-based application

Patented technology for power, water generation and air conditioning

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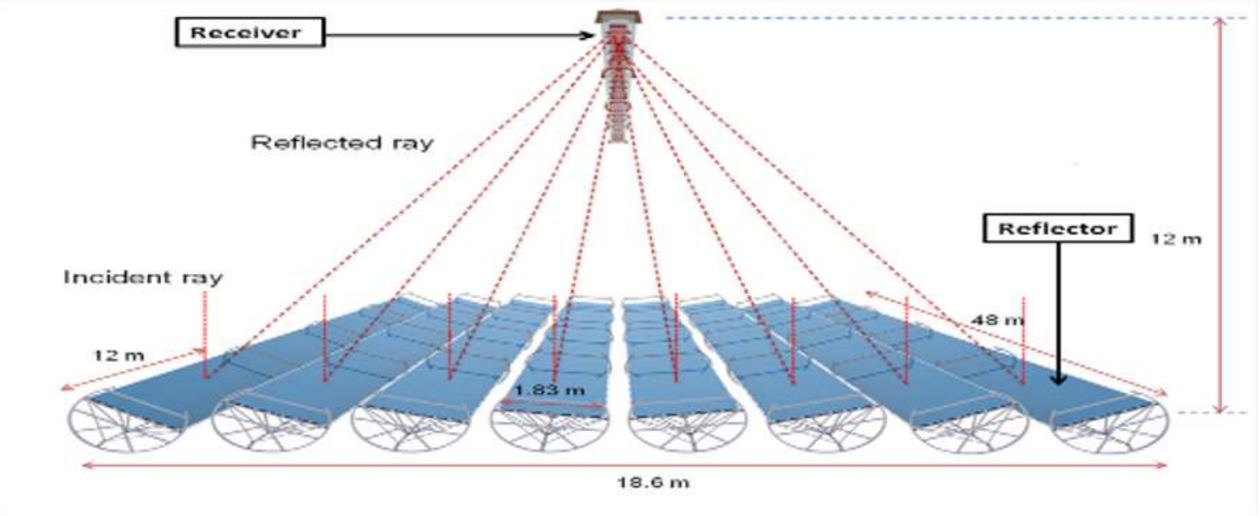
Energizing communities

Concentrating Solar Thermal Power Linear Fresnel Reflector (LFR)

- Simple and Robust System
- Efficient Single Axis Tracking
- Compact and Land Efficient
- Very Low Wind Resistance
- Direct Steam Generation
- Solar to steam conversion efficiencies >65%
- Easy to clean and operate

At Empereal, we are committed to continuous research & development Empereal-KGDS is our Solar thermal and Water desalination subsidiary



Our Solar Thermal Research & Development Centre - Tamil Nadu, India

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SOLAR CSP SOLUTIONS

Solar Desalination Systems

Generate fresh water using solar energy through solar desalination using MED, RO or Forward Osmosis.

Facilitates community scale, decentralized power and water generation

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www.empereal.com

Empereal's LFR: Custom Made Configurations




High Temperature With Thermal Storage	Medium Temperature Applications	Low Cost High Efficiency System	Solar Thermal Storage
400˚C to 500˚C super heated steam	Up to 260˚C saturated steam	For hot water applications (80˚C to 98˚C)	Molten salt in PCM mode and accumulator-based storage
Useful for power generation with efficient thermal storage	Useful for power generation or combined power and water desalination solutions and EOR	For water desalination and air conditioning	Used in power generation and energy solutions for 24x7 operation
Provides high efficiency and cost-effective energy storage	Can suit a wide range of operating paramet	Can be combined with thermal storage for continuous operation	Customizable for different operating temperatures and pressure

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SOLAR CSP SOLUTIONS

Fine Tuning The World's Largest LFR Plant - Rajasthan, India

The 125 MW CLFR solar power plant faced major production and operational challenges

Empereal conducted the study and innovative steps for major performance enhancement and reliable operation

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SOLAR CSP SOLUTIONS

Solar Thermal for Solar Desalination - Designed and setup for MASDAR, UAE

- Empereal LFR based Solar Thermal system - 40,000 Liters per day of 98°C water for solar desalination
- Designed and setup for MASDAR, UAE
- Inaugurated by Masdar CEO on May 2017
- Commissioned in May 2017

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SOLAR DESALINATION SYSTEMS

Tapping Unutilized Resources To Improve the Sustainability Of A Coal Plant

Flue Gas based Sea Water Desalination System

Blow Down Water from Cooling Tower

Flue Gas from Chimney

The flue-gas based desalination plant in Simhadri 2000MW Coal Power Plant was inaugurated on 11 February 2017

The system captures the waste heat to recycle the cooling tower blow down water to produce 150,000 litres per day of 0.5ppm Demineralized water for the super critical coal boilers

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SOLAR DESALINATION SYSTEMS

Solar Thermal Desalination: 1500 MW NTPC Vallur Coal Power Plant

- Solar Thermal hot water driven MED based thermal desalination to convert seawater into potable grade water
- Empereal's Role: Design, Detailed engineering, System Integration, Implementation and Commissioning
- Capacity: 125,000 Liters per day of potable water.

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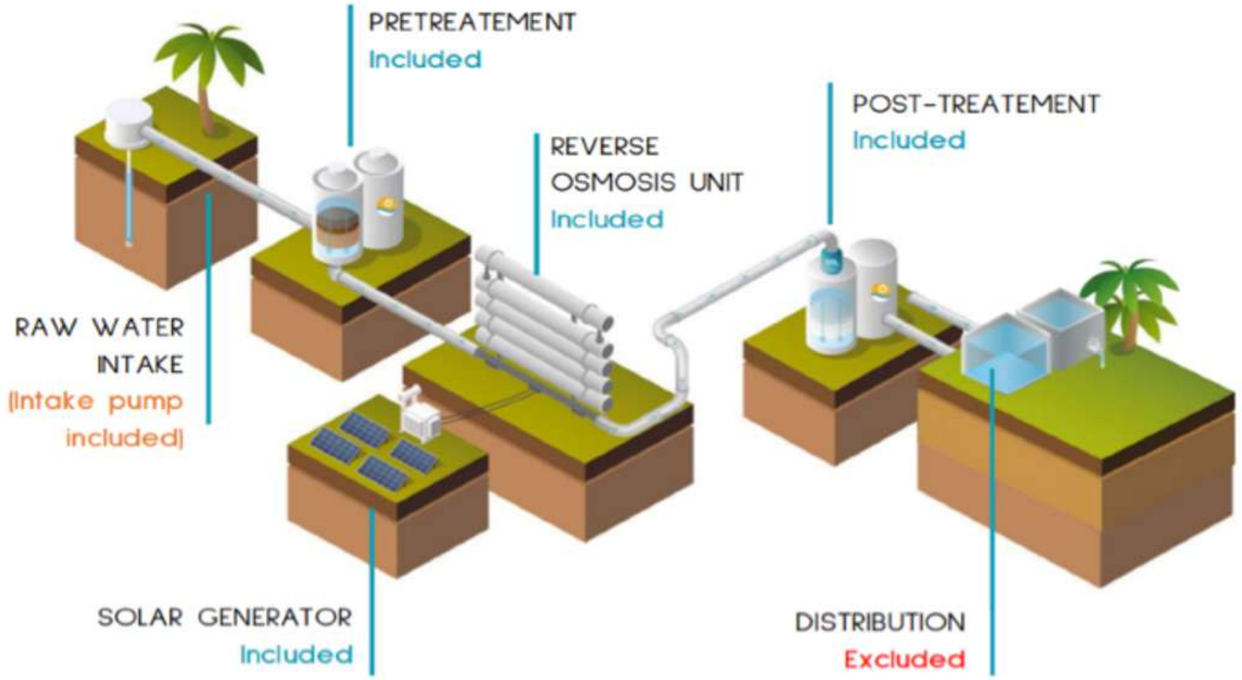
Solar Desalination For Islands

- Solar PV powered solar desalination system
- Designed with Solar PV and Reverse Osmosis systems for fully automated operation
- Works in fully standalone off-grid or hybrid mode for 24X7 fresh water generation
- Can be used with seawater or brackish water desalination solutions



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SOLAR DESALINATION SYSTEMS

Solar Desalination
Achievements & Awards

- Produces ultra-pure industrial grade water (< 5ppm)
- Direct saturated steam generating LFR technology
- Thermal energy storage for uninterrupted and reliable operation
- Integration of solar and biomass for round-the-clock production
- Durable and safe technology
- Unique, Innovative, Scalable, Replicable, Eco-friendly, Decentralized
- Listed as one of the Top 8 Technology Innovations of 2011 by MIT, USA

The project won the National Innovation Award for 2014 from Indian Chamber of Commerce (FICCI) and HSBC

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MEMBERSHIPS & REGISTRATIONS

Global Waste Cleaning Network

Middle East Solar Industry Association

Global Clean Water Desalination Alliance

Quality Management System

Occupational Health & Safety Management Systems

Environment Management System

Dubai Office

211, ARENCO BUILDING 4, Dubai Investment Park - 1 - Green Community Village - Dubai

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