Energy Building | Union Drammen | Oslo, Norway

Meta description: Photovoltaic Screen Printed façade - Screen Printed PV Glass – Iconic Power Skin – Green Wall – Active Building Material

Signature date: March 2015
Execution date: May 2015 to September 2015

Client: Grønland 67 AS, Drammen, Norway
Owner : Union Eiendomsutvikling AS, Drammen, Norway
Local facilitator: Fusen.no , Rasta, Norway
Architect : Ingebjørg Lien, LOF Arkitekter as, Oslo, Norway

ISSOL deliverables:

- Engineering
- Design of photovoltaic glasses based on façade measurements & geometry
- Screen printing samples approved by architect
- Verification of conformity with norms and building codes
- Mechanical tests and accelerated aging tests
- Yield calculations
- Execution drawing of the façade
- Dimensioning of the PV arrays
- Glass cutting & screen printing
- Manufacturing of PV glazing
- Supply
- Reporting
- Installation support

Project end: 2015
Surface: 1215 m²
Power: 127,5 kWc
Yearly production: 55,5 MWc

Location: Oslo, Norway

Description: The Energy Building for Union Eiendomsutvikling is the first project in the world that was ever made applying a screen printed layer on the first glass of the PV glazing. The objective of the project was to replicate a green wall according to the requirements of the architects.

© Ingebjørg Lien, LOF Arkitekter as, Oslo. Credit : OEC

Technical challenges:

- 26 different shapes of PV safety glasses
- Best possible rendering of a green wall while minimizing the yield lost due to the green image printed on the front glass
- ISSOL R&D team reached a final yield of 83 % in comparison with non-printed PV glasses

Features:

- Glass glass - PV Safety Glass
- Green screen printing on front glass
- High efficiency mono crystalline solar cells
- Conformity with building code (loads: -1096 N/m2 for suction, 775 N/m2 for pression)
- 26 different shapes
- 4.2.5 mm thickness according to NF DTU 39
- Low Iron glass

What made it possible for ISSOL?

- The capacity of ISSOL to respond to the strict requirements of the architect
- ISSOL's strong R&D team who developed the Screen printed PV glass
- ISSOL offers global solutions, including design, manufacturing
- ISSOL's experience in the respect of building code for integration of the photovoltaic technology
- Local partner & facilitator
- ISSOL's references

More pictures: check www.issol.eu/en/picasa

ISSOL sa/nv | Zoning Industriel des Plénesses | Rue du Progrès 18 | 4821 Dison (Liège) | Belgium
TVA/VAT # BE 0879.446.738 | Phone: +32 87 33 81 64 | Email : infopv@issol.eu | www.issol.be

Palais de Justice de Paris (Paris Courthouse)

Type de projet : Brises-Soleil photovoltaïques
Date de signature: Septembre 2015
Date d'exécution: Janvier 2016 à septembre 2016
Client: Bouygues Bâtiment Ile-de-France
Maître d'œuvre : Arélia sous contrat de partenariat public/privé (PPP)
Architecte : Renzo Piano

Implications d'ISSOL:

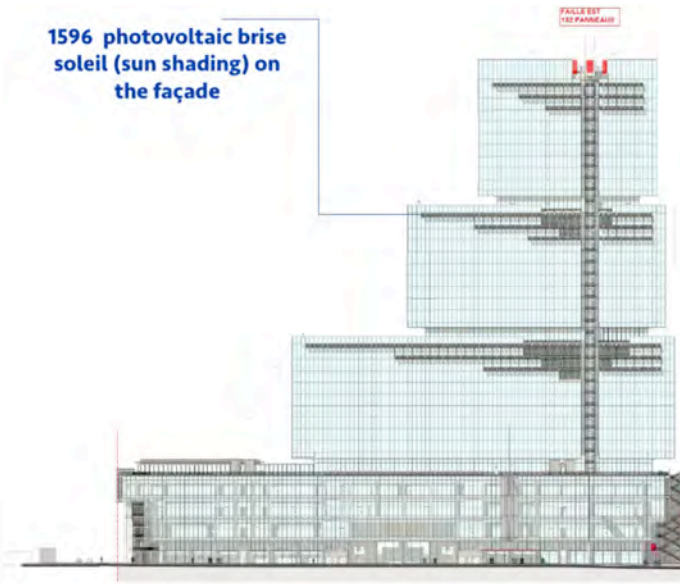
- Design des brises soleil photovoltaïques
- Design et calcul du système de fixation
- Conception conformément aux normes
- Fourniture des vitrages PV
- Etude et dimensionnement électrique
- Supervision de la pose
- Travaux d'installation électrique
- Pose en collaboration avec Permasteelisa
- Accompagnement chantier
- Réception du chantier
- Formation

Fin du projet : 2016
Puissance: 325 kWc
Unités : 1596 brises soleil en façade et 152 vitrages actifs en toiture
Surface: 1931m^2 en façade – 360 m^2 en toiture
Productible annuel : 312 MWc

Lieu: Paris, quartier de Clichy-Batignolles

Vidéo du projet : https://youtu.be/KO8nu_3nb1c

Description:
Brises Soleil en casquette sur la façade et verticaux le long de la colonne d 'ascenseur.
Hauteur du bâtiment : 160 mètres



© Renzo Piano Building Workshop, architects

Description du projet :

Egalement appelée la Cité judiciaire de Paris, le Palais de justice est un complexe architectural destiné à abriter les nouveaux locaux des tribunaux d'instance répartis dans chacun des vingt arrondissements de la capitale, du tribunal de grande instance de Paris, ainsi que ceux de la Direction régionale de la police judiciaire (source : Wikipedia)

Description techniques :

ISSOL intervient en tant qu'entreprise spécialisée dans la mise en place d'éléments constructifs actifs, en l'occurrence, des brises soleil photovoltaïques fixés sur la façade sud de l'immeuble. Il s'agit de vitrages feuilletés semi-transparents équipés de cellules photovoltaïques à haut rendement. Les éléments sont conformes aux normes de la construction et particulièrement à la norme Bs1d0¬ relative à la résistance au feu en cas d'incendie (incombustible et non-propagateur de feu).

Particularités:
Particularité : verre feuilleté 4 :2 :4 actif et durci qui se verrouillent dans le cadre en cas de casse.

Ce qui a rendu le projet possible?

- ISSOL intervient en tant qu'interlocuteur unique et offre un solution globale à son client (fabrication, pose, garanties)
- Expérience d'Issol dans la conception et le respect des normes liées aux bâtiments
- Références similaires d'Issol
- Solidité financière

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TVA/VAT # BE 0879.446.738 | Phone: +32 87 33 81 64 | Email : infopv@issol.eu | www.issol.be

Cité Musicale de l'Île Seguin - Paris

Date de signature: Septembre 2015
Date d'exécution: Novembre 2015 à mars 2016
Client: TCE Solar – Bouygues Construction
Maître d'œuvre : Bouygues Bâtiment Ile-de-France (consortium Tempo Ile Seguin)
Architecte : Shigeru Ban, architecte japonais

Livrés par ISSOL:

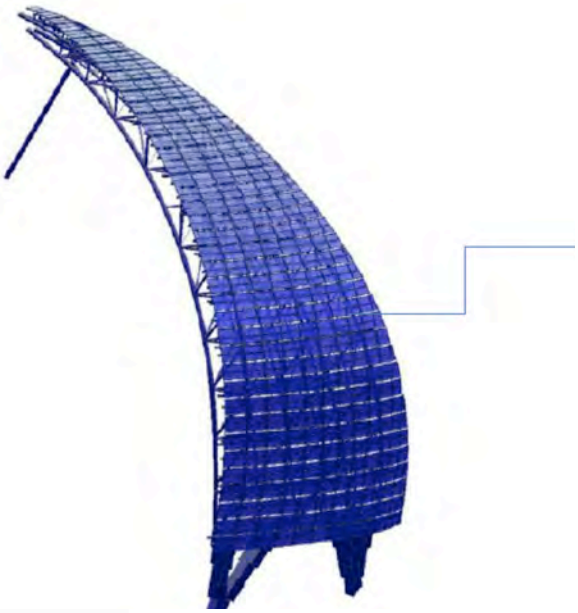
- Design du vitrage photovoltaïque
- Conception conformément aux normes
- Conception du système de pose
- Certifications et ATEX
- Fourniture des vitrages PV
- Fourniture du système d'attaches à la structure mécanique
- Supervision de la pose
- Accompagnement chantier

Fin du projet : 2016
Surface: 1000 m²
Puissance: 115 kWc
Productible annuel : 127 MWc

Lieu: Ile Seguin à Boulogne-Billancourt (Paris)

Description:
Situé en pointe aval de l'Île Seguin sur la Seine à Paris, la Cité de la Musique est constituée d'un auditorium et d'une sale de spectacle. Ce bâtiment a pour vocation de favoriser l'accès de tous à la musique.

L'auditorium, posé sur la Seine, est orné d'une grande voile photovoltaïque de plus de 1000 m2. Un système mécanique autour de l'auditorium lui fait suivre la course du soleil.



© Shigeru Ban

Défits techniques :
De nombreux vitrages ont été rectifiés pour épouser la forme de la voile. Ils sont tous actifs. Il s'agit de vitrages feuilletés (verre-verre) photovoltaïques conformes aux normes de la construction et particulièrement à la norme Bs1d0¬ relative à la résistance au feu en cas d'incendie (incombustible et non-propagateur de feu).

Particularités:
Particularité : 454 vitrages photovoltaïques équipés de cellules irisées vertes. Structure métallique construire hors-site et amenée par barge.

Ce qui a rendu le projet possible?

- Capacité d'ISSOL de répondre précisément aux exigences de l'architecte en matière de rendu irisé et de couleur
- Expérience d'ISSOL dans la conception et le respect des normes liées aux bâtiments
- Références similaires d'ISSOL
- Solidité financière

Treurenberg Building (Brussels)

Project type: Net Zero Energy office building with active roof and facades. .
Signature date: March 2015
Execution date: July 2015 to October 2015
Client: Democo NV
Owner : Axa Belgium
Architect : Assar Architects (Brussels)

ISSOL deliverables :

- Design of photovoltaic glasses with many shapes
- Respect of norms and building codes
- Conception of mounting system
- Supply of PV glasses and electrical equipment's
- Supply of cladding system
- Supply of electrical equipment's
- Installation and commissioning
- Project management

Project end: 2015
Surface: 1200 m²
Power: 207 kWc
Yearly production: 144 MWc

Location: Brussels, Belgium

Description:
The building is articulated around an atrium which opens at the ground floor via a patio giving on the enclosure and develops a splendid interior space on the fifth floor overhanging the historical center of Brussels. This space opens on an external terrace.
The objective is to propose a building, whose envelope, equipment's and finishing respect the criteria of a green building: energy saving in the long run, with an "Excellent" BREEAM certification;. (Source: http://www.assar.com/)

© Assar Architects - Brussels

Technical challenge:
Photovoltaic black colour safety glasses of different shapes are integrated into the facade and are replacing conventional non-active building materials. East, south and west façade are equipped with PV glasses.

Features:
6 shapes of PV safety glasses.
PV safety glass with 5.2.5 mm thickness.
High efficiency mono crystalline silicone cells.
Deep pyramidal structured front glasses; allowing substantial efficiency gain on vertical facades.

What made it possible for ISSOL?

- ISSOL acting a single point of contact for the entire PV project
- ISSOL offers global solutions, including design, manufacturing and installation
- ISSOL's experience in the respect of building code for integration of the photovoltaic technology.
- ISSOL's references
- ISSOL's bankability

Paris Habitat - Daviel
France

Project title: Photovoltaic Facade
Architect(s): Atelier Cité Architecture
Owner: Paris Habitat
General contractor: Setal
Project manager: BIPV project implemented by ISSOL sa/nv

Issol's deliverables:

- Product design
- System design
- Integration system design
- Manufacturing
- Project management
- Installation/Mounting
- Commissioning
- Maintenance

Completion year: 2011
Surface: 600 m²
Power: 44 kWc
Estimated Production: 29,4 MWh/year

Location: Paris, 13th

Project description:
Construction of a PV façade implemented with four different types of tailor-made active modules

Design challenges:
Building Integrated PV | Photovoltaic facade | Substitution of cladding | Great appearance due to proper and high finish grade

Technical challenges:
Made-to-measure modules | semi-transparent modules | Made-to-measure mounting system | Different thickness of glass to reach technical and astatic client requirements

PV technology:
Mono crystalline PV technology | 10638 cells – 6" – 4,36 Wp

PV module type:
Semi-transparent glass-tedlar module | CENIT 220/MODEL 246-6122 ; CENIT 220/MODEL 197-6122 CENIT 220/MODEL 221-6122

What makes the project possible?
Real commitment of Paris Habitat towards sustainable energy | Ability of Issol to listen carefully to the architect's and to develop very tailored solutions | Ability of Issol to respond to the highest standards (quality/processes, project management, bankability)

Project milestones
2011 : work starts
2011 : work ends

Beneteau Building
Givrand - France

Project title: Photovoltaic canopy
Architect(s): F PERIOT Architect
Owner: Beneteau Spbi
General contractor: Marchegay / EDF ENR
Project manager: BIPV project implemented by ISSOL sa/nv

Issol's deliverables:

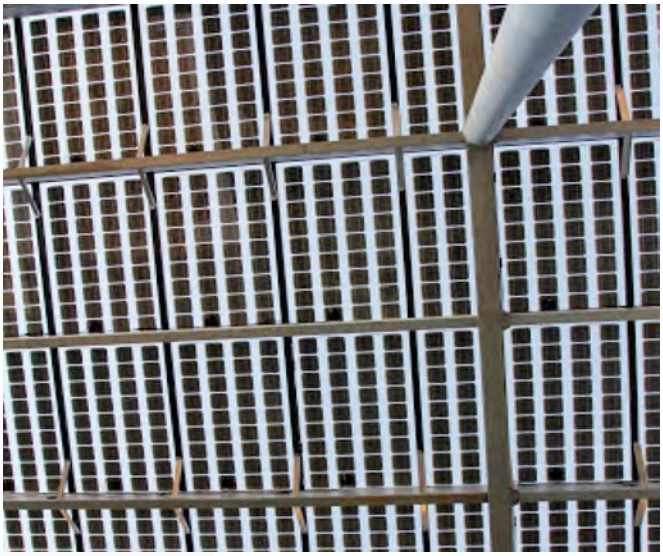
- Product design
- System design
- Integration system design
- Manufacturing
- Project management

Completion year: 2013
Surface: 435 m²
Power: 40 kWc
Estimated Production: 36,4 MWh/year

Location: Givrand - West Coast of France

Project description
Active glass roof implemented in a subsidiary company of Beneteau SPBI.

Design challenges:
Semi transparent glass/glass modules | Homogeneous rendering | Building integrated PV | Watertight covering over the parking company



Technical challenges:
Proposal of two different mounting systems :

- Curtain wall system
- 4 attaches VEC

Proposal of three different variants of active glass to meet the expectations of our customer.

PV technology:
Mono crystalline PV technology | 9288 cells – 6" – 4,40 Wp | cells colour "deep black"

PV module type:
Semi transparent extra clear glass-glass module | CENIT 220/MODEL 145-6122 & CENIT 220/MODEL 75-6122

What make the project possible?
Real commitment of Beneteau towards sustainable constructions | Ability of Issol to listen carefully to the architect's and to develop very tailored solutions | Ability of Issol to respond to the highest standards (quality/processes, project management, bankability)

Project milestones
2012 : works starts
2013 : work is completed

Elia Car park
Brussels

Project title: Energy producer Car park for electric car
Architect(s): Architectes Associés
Owner: Elia
General contractor: Issol
Project manager: BIPV project implemented by ISSOL sa/nv

Issol's deliverables:

- Product design
- System design
- Integration system design
- Manufacturing
- Project management
- Installation/Mounting
- Commissioning
- Maintenance

Completion year: 2014
Surface: 4.250 m²
Power: 434 kWc
Estimated Production: 349 MWh/year

Location: North of Brussels city centre

Project description:
Construction of a PV integrated covered car park with electric car charging terminals

Design challenges:
Building Integrated PV | Semi-transparent covering | Nearly watertight covering over the car park

Technical challenges:
Made-to-measure modules | Semi-transparent modules | Made-to-measure mounting system to ensure nearly watertight covering | Fire security shut-down system

PV technology:
Mono crystalline PV technology | 104 242 cells – 6" – 4,44 Wp

PV module type:
Semi-transparent glass-tedlar module | CENIT 220/MODEL 250-6621 & CENIT 220/MODEL 135-6121

What make the project possible?
Real commitment of Elia towards sustainable energy | Ability of Issol to listen carefully to the architect's and to develop very tailored solutions | Ability of Issol to respond to the highest standards (quality/processes, project management, bankability)

Project milestones
2013 : work starts
2014 : work ends

GDF SUEZ Building
Dijon - France

Project title: Façade Restoration with semi-transparent Photovoltaic Glass/Glass modules
Architect(s): PHILEAS Architects
Owner: GDF SUEZ
General contractor: CANSOL
Project manager: BIPV project implemented by ISSOL sa/nv

Issol's deliverables:

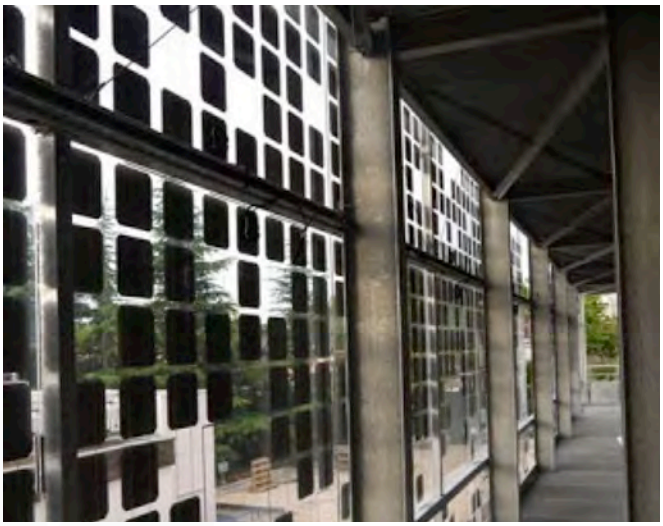
- Product design
- System design
- Integration system design
- Manufacturing
- Project management
- Installation/Mounting
- Commissioning
- Maintenance

Completion year: 2011
Surface: 952 m2 (South East & South West)
Power: 74 kWc
Estimated Production: 46,125 MWh/year

Location: Dijon city - France

Project description:
Construction of a Building Integrated PV façade system to meet architect's requirements

Design challenges:
Semi transparent active glass combining both aesthetic design and transparency allowing workers to keep a good visibility on the outside. | PV modules acting as a building materials | Substitution of cladding.



Technical challenges:
PV glass subject to harsh weather condition. Tender specifications :

- Temperature : -40°C to +85°C
- Relative Humidity: 100%
- Wind velocity: 200 km/h
- Pouring rain and heavy hail (<25mm)

Successfully tested alongside several experiments conducted by The CSTC.

PV technology:
Black Mono Crystalline PV technology | 18040 cells - 6" – 4,26 Wp | 41 cells per active glass.

PV module type: 440 modules (each weight 60Kg)
Semi-transparent glass/glass diamond securit module | CENIT 220/MODEL 170-6122

What makes the project possible?
Real commitment of GDF SUEZ towards sustainable energy | European context "Nearly-Zero Energy Building Directive" 2010/31/EU | Ability of Issol to listen carefully to the architect's and to develop very tailored solutions | Ability of Issol to respond to the highest standards (quality/processes, project management, bankability)

Project milestones
2011 : work starts
2011 : July

Project title: Photovoltaïc bends to meet architect's requirement
Architect(s): CEPEZED architects / SAMYN
Owner: Tour & Taxis
General contractor: Van Laere sa/nv
Project manager: BIPV project implemented by ISSOL sa/nv

Issol's deliverables:

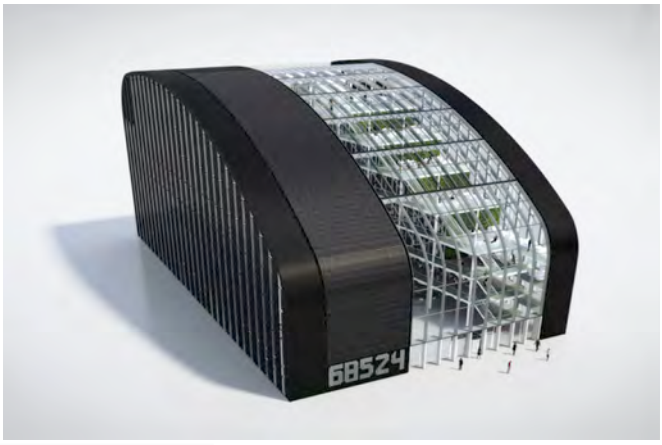
- Product design
- System design
- Integration system design
- Manufacturing
- Project management
- Installation/Mounting
- Commissioning
- Maintenance

Completion year: 2014
Surface: 700 m²
Power: 104 kWc
Estimated Production: 90 MWh/year

Location: Tour & taxis, North of Brussels

Project description:
Construction of a Building Integrated PV roof and façade system to meet architect's requirements

Design challenges:
No Photovoltaic/Technology appearance | PV façades and roofs with curved junction | Walkable PV modules (for cleaning) | PV modules acting as a building materials; Substitution of cladding.



Technical challenges:
Deep black modules with no visible ribbons or wires | No visible mounting system | Curved PV modules | PV modules thickness adapted to make them walkable.

PV technology:
Full black Mono crystalline PV technology | 24 000 cells – 6" – 4,57 Wp | No visible ribbons or wires.

PV module type:
Opaque glass-tedlar module | CENIT 220/MODEL 265-6110 "Deep Black"

What make the project possible?
European context "Nearly-Zero Energy Building Directive" 2010/31/EU | Brussels region context where this directive will be enforced in 2015 (instead of 2018/2020 for the rest of EU) | Ability of Issol to listen carefully to the architect's and to develop very tailored solutions | Ability of Issol to respond to the highest standards (quality/processes, project management, bankability)

Project milestones
2013 : work starts
2014 : Main building is completed, staff transfer
10/2013 : installation of th PV glasses starts

Urban Community Building - LA CUB
Bordeaux - France

Project title: Double-Glazed Photovoltaic Facade with mural painting
Architect(s): BDM Architects
Owner: City of Bordeaux
General contractor: Castel Alu
Project manager: BIPV project implemented by ISSOL sa/nv

Issol's deliverables:

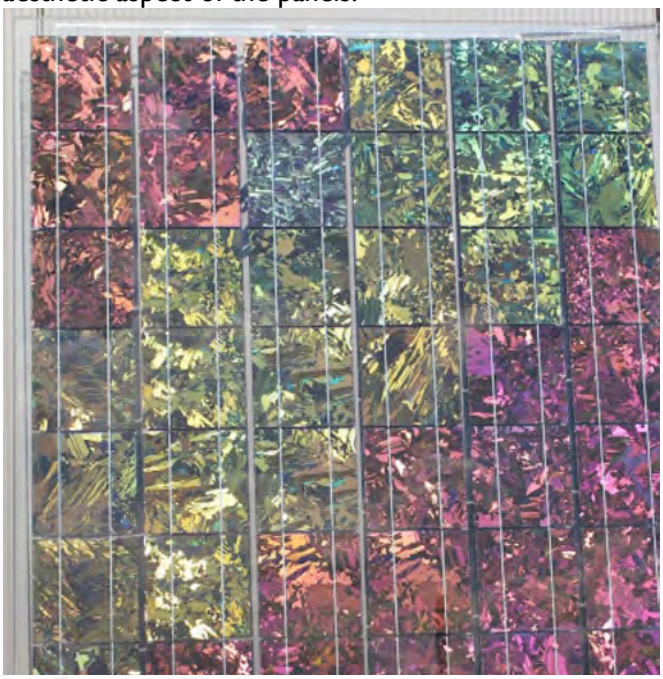
- Product design
- System design
- Integration system design
- Manufacturing
- Project management
- Installation/Mounting
- Commissioning
- Maintenance

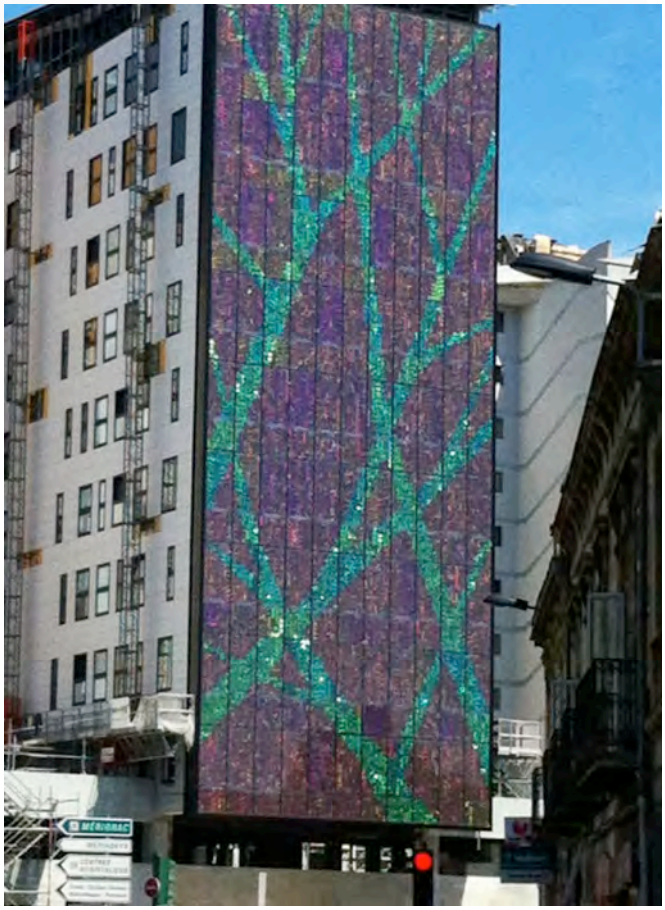
Completion year: 2012
Surface: 340 m²
Power: 39 kWc
Estimated Production: 30 MWh/year

Location: Bordeaux City Center

Project description:
Construction of a Double-glazed Photovoltaic façade with mural painting

Design challenges:
No Photovoltaic/Technology appearance | PV facades | PV modules acting as a building materials; Substitution of cladding. Find the best ratio between efficiency and aesthetic aspect of the panels.





Technical challenges:
Integration of coloured cells in a double-glazed photovoltaic panel in order to create a two colours tree effect in violin and green | No visible mounting system

PV technology:
Coloured poly crystalline Metallic Gold (MG) & Disco Pink (DP) | 11022 cells (2651MG & 8371DP) – 6" – 3,5 & 3,74 Wp | No visible ribbons or wires.

PV module type:
Semi-transparent glass-glass module | CENIT 220/MODEL 120 to 265 -6122 "Pixelated"

What make the project possible?
European context "Nearly-Zero Energy Building Directive" 2010/31/EU | Ability of Issol to listen carefully to the architect's and to develop very tailored solutions | Ability of Issol to respond to the highest standards (quality/processes, project management, bankability)

Project milestones
2011 : work starts
2012 : work is completed

PERPIGNAN Rail Station
Perpignan, France

Project title: Semi-transparent Solar Wave above the Rail Station building
Architect(s): L35 Architects
Owner: Issol & IGP Issol
General contractor: Metrovacesa
Project manager: BIPV project implemented by ISSOL sa/nv (as Third Party Investor)

Issol's deliverables:

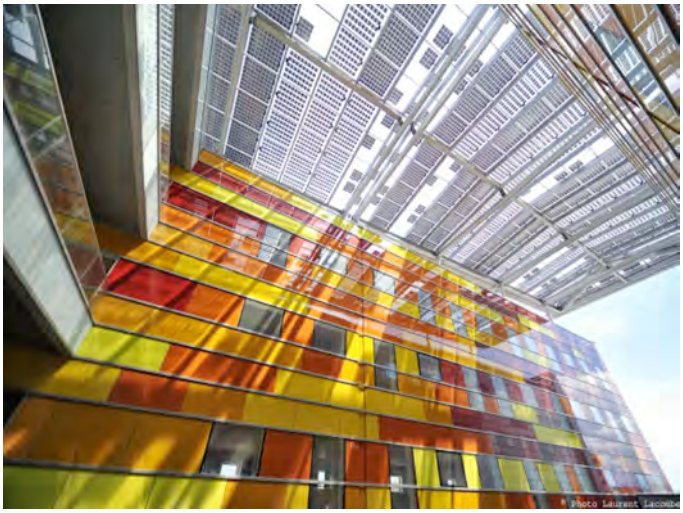
- Product design
- System design
- Integration system design
- Manufacturing
- Project management
- Installation/Mounting
- Commissioning
- Maintenance

Completion year: 2012
Surface: 2.700 m²
Power: 250 kWc
Estimated Production: 260 MWh/year

Location: near Perpignan City center

Project description:
Construction of a semi-transparent Solar Wave Roof above the Rail Station Building

Design challenges:
Integrated PV roof | Semi-transparent covering | Nearly watertight covering over the train station commercial gallery



Technical challenges:
Made-to-measure mounting system to ensure the water tightness of the active glass roof | Made-to-measure modules | Modules with different degrees of transparency |

PV technology:
Poly Crystalline Silicon cells | 61 460 cells – 6" – 3,90 Wp

PV module type:
Semi-transparent glass-tedlar module | CENIT 220/MODEL 290-6121, CENIT 220/MODEL 170-6121 & CENIT 220/MODEL 50-6121

What makes the project possible?
Real commitment of SNCF towards sustainable energy | Ability of Issol to listen carefully to the architect's and to develop very tailored solutions | Ability of Issol to respond to the highest standards (quality/processes, project management, bankability)

Project milestones
2010: work starts
2011: work ends

The French Ministry of Defense - Balard

Project title: Photovoltaics meets the zinc roofs of Paris
Architect(s): Nicolas Michelin Agency & Associates
Owner: French Ministry of Defense
General contractor: Consortium « Opale Defense » led by Bouygues Constructions
Project manager: BIPV project implemented by ISSOL sa/nv

Issol's deliverables:

- Product design
- System design
- Integration system design
- Manufacturing
- Project management
- Installation/Mounting
- Commissioning
- Maintenance

Completion year: 2014
Surface: 8000 m²
Power: 820 kWc
Estimated Production: 860 MWh/year

Location: South West of Paris (15e) – Headquarter of the French Army, Airforce & Navy

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Green architecture:
Environmental Standards – © HQE & BREEAM Certification | Bioclimatic design with assisted natural air ventilation. Self-sufficient building 10 months per year | 80% of energy needs will be produced on site using renewables

Design challenges:
No Photovoltaic/Technology appearance | Homogeneous rendering – dark zinc – Paris roofs | Triangular shaped roofs with 1,500 different module shapes to match the roof geometry | PV modules acting as building materials. Substitution of steel gratings (caillebotis)

© www.info-chantier-balard.fr

Technical challenges:
No visible ribbons or wires | Fire Class M0/M1 (BS1d0) – no combustibility | Special module assembling & components | Anti glaring – Candela < 10000 – for safe airship landing | Deep pyramidal structured glass | 9 mm laminated safety glass for accidental shock resistance – glass/glass | No visible mounting system |PV glasses raised on steel framework and fixed on secondary aluminium structure.

PV technology:
Mono crystalline PV technology |187 000 cells – 6" – 4,46 Wp | Custom-made cells colour "Grey zinc" – special development | No visible ribbons or wires | Fire Class M0/M1 (BS1d0) – no combustibility

PV module type:
Opaque glass-glass module | CENIT 220/MODEL 220-6111 "Stealth" & made-to-measure not rectangular CENIT 220 Design "Stealth" modules

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What make the project possible?
Real commitment of Bouygues Construction towards sustainable constructions | European context "Nearly-Zero Energy Building Directive" 2010/31/EU | Ability of Issol to listen carefully to the architect's and to develop very tailored solutions | Ability of Issol to respond to the highest standards (quality/processes, project management, bankability)

Project milestones
2011 : works starts
2014 : Main building is completed, staff transfer starts
2016 : Occupation of the entire "Balard" site
09/2013 : installation of 8000 m² of PV glasses starts
12/2014: end

Villaverde, Marchegay-Guérande, France

Project title: Semi-transparent fotovoltaic Façade on a garden store
Architect(s): ??
Owner: VILLAVERDE MARCHEGAY ?
General contractor: EDF ENR
Project manager: BIPV project implemented by ISSOL sa/nv

Issol's deliverables:

- Product design
- System design
- Integration system design
- Manufacturing
- Project management
- Installation/Mounting
- Commissioning
- Maintenance

Completion year: 2013
Surface:
Power: 24 kW
Estimated Production:

Location: North West coast of France near Nantes

Project description:
Construction of a new PV Façade on the garden store

Design challenges:
Building Integrated PV | Semi-transparent covering | Nearly watertight covering Facade

Technical challenges:
Made-to-measure modules | Semi-transparent modules | Made-to-measure mounting system to ensure nearly watertight covering | Fire security shut-down system

PV technology:
Mono crystalline PV technology | 104 242 cells – 6" – 4,44 Wp

PV module type:
Semi-transparent glass-tedlar module | CENIT 220/MODEL 250-6621 & CENIT 220/MODEL 135-6121

What make the project possible?
Real commitment of Elia towards sustainable energy | Ability of Issol to listen carefully to the architect's and to develop very tailored solutions | Ability of Issol to respond to the highest standards (quality/processes, project management, bankability)

Project milestones
2013 : work starts
2013 : work ends