



Lumiduct™

GENERATE

REGULATE

COMMUNICATE

ACTIVATE YOUR FAÇADE

To maximize building performance

Lumiduct™ - basic

GENERATE

REGULATE

Lumiduct™ - media

GENERATE

REGULATE

COMMUNICATE

BENEFITS

1 GENERATE



Most efficient
solar panels in
the world



Unique transparent
shading allows up
to 3 times more
daylight to enter



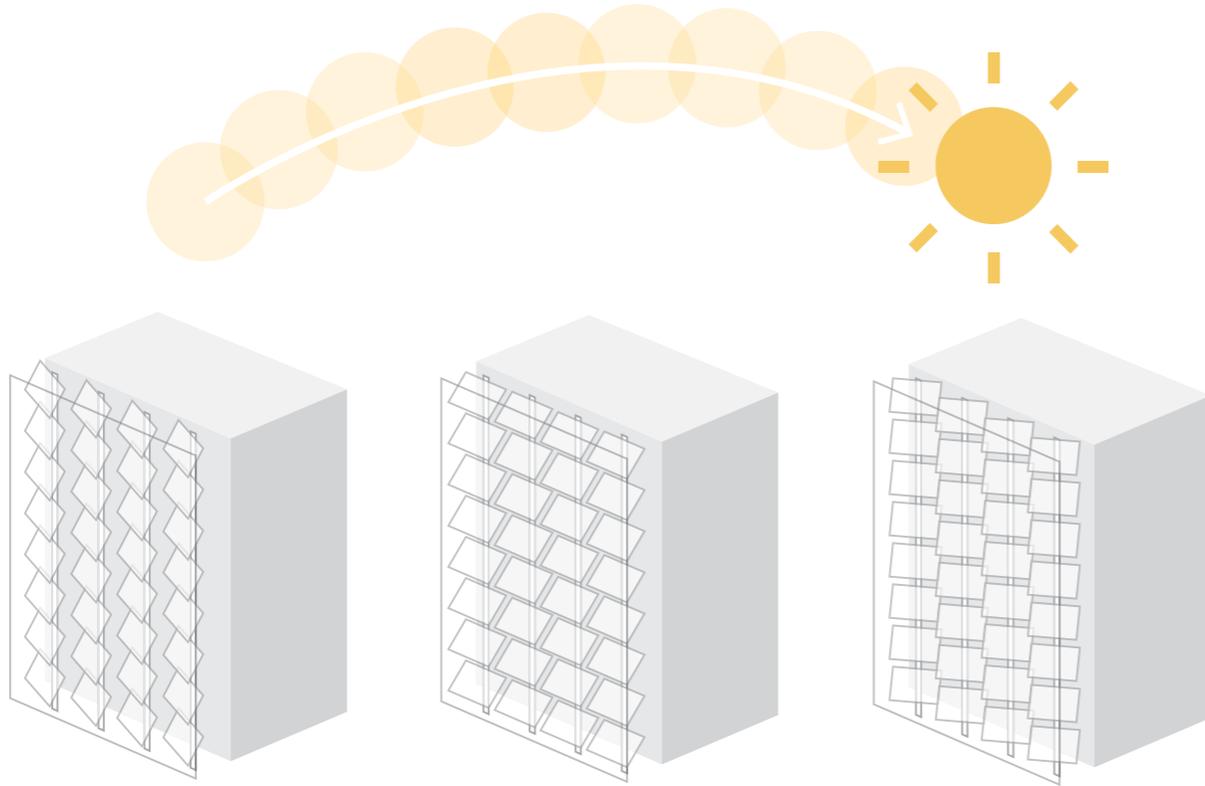
**Powerful
communication
with an integrated
LED media display**

3 COMMUNICATE



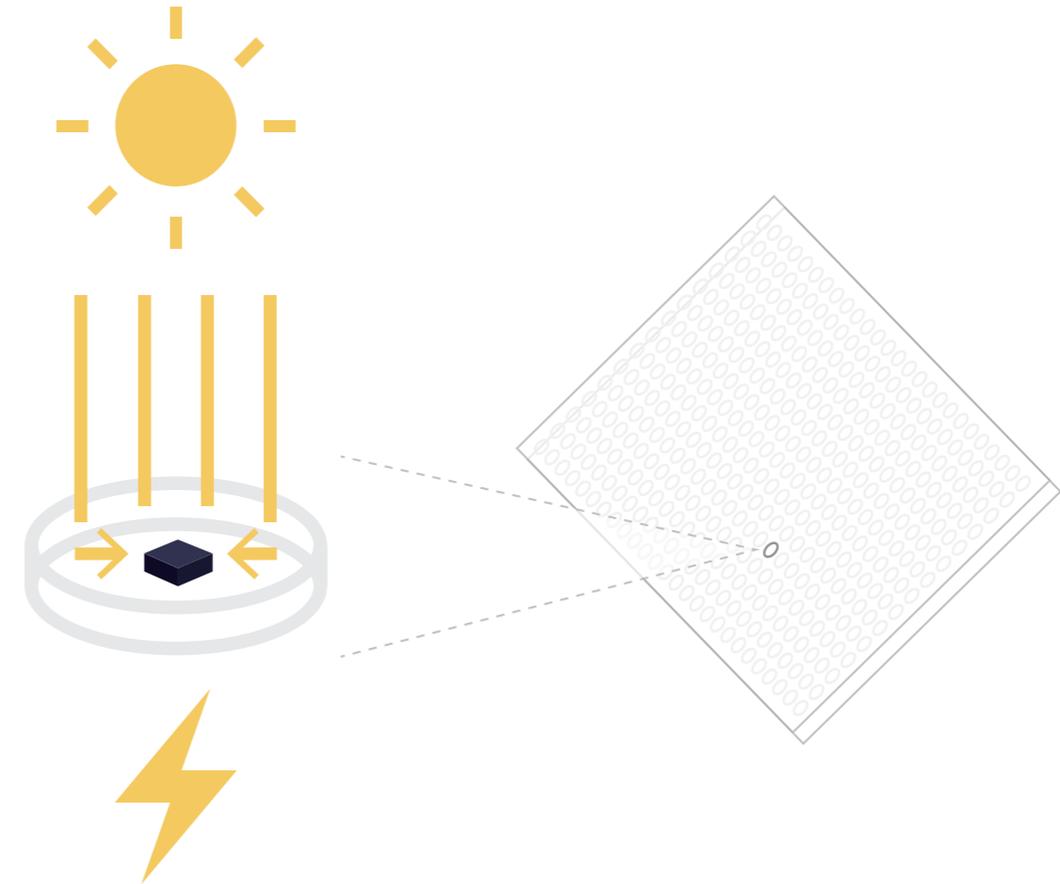
HOW IT WORKS

1 PANELS AUTOMATICALLY TRACK THE SUN



- > Directs the panels towards the sun to enable energy production and daylight control
- > Movement of the panels is unnoticeable
- > Highest unobstructed view to the outside of all shading systems
- > Energy consumption required for tracking is < 1% of the power generated

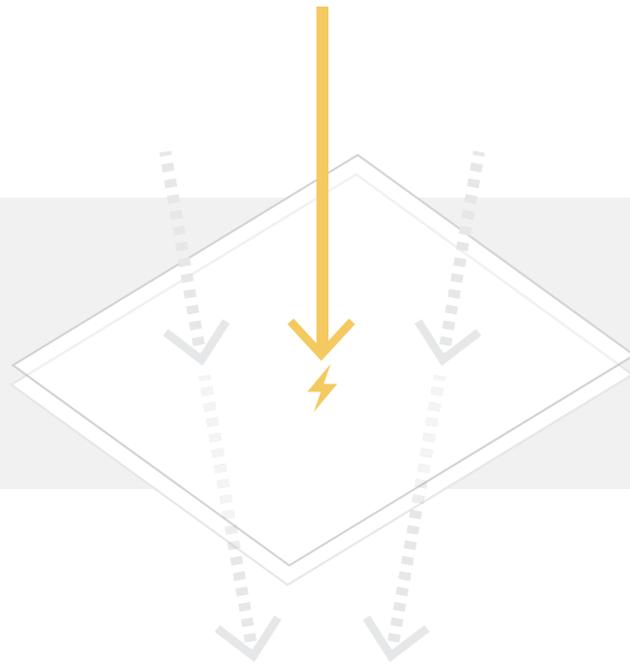
2 SOLAR ENERGY IS PRODUCED



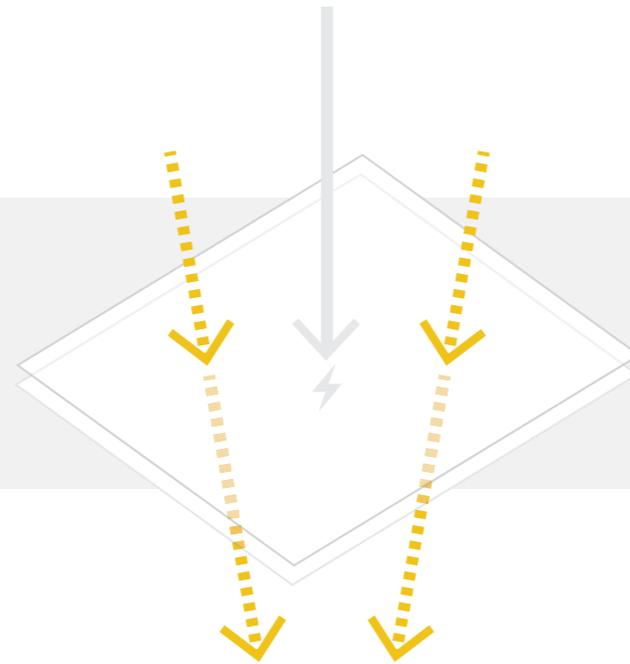
- > Panel efficiency is 30%
- > Peak power is 300 Wp/m² (under Standard Test Conditions)
- > Heat is blocked and can be harvested

3 DAYLIGHT IS CONTROLLED

Direct light is blocked

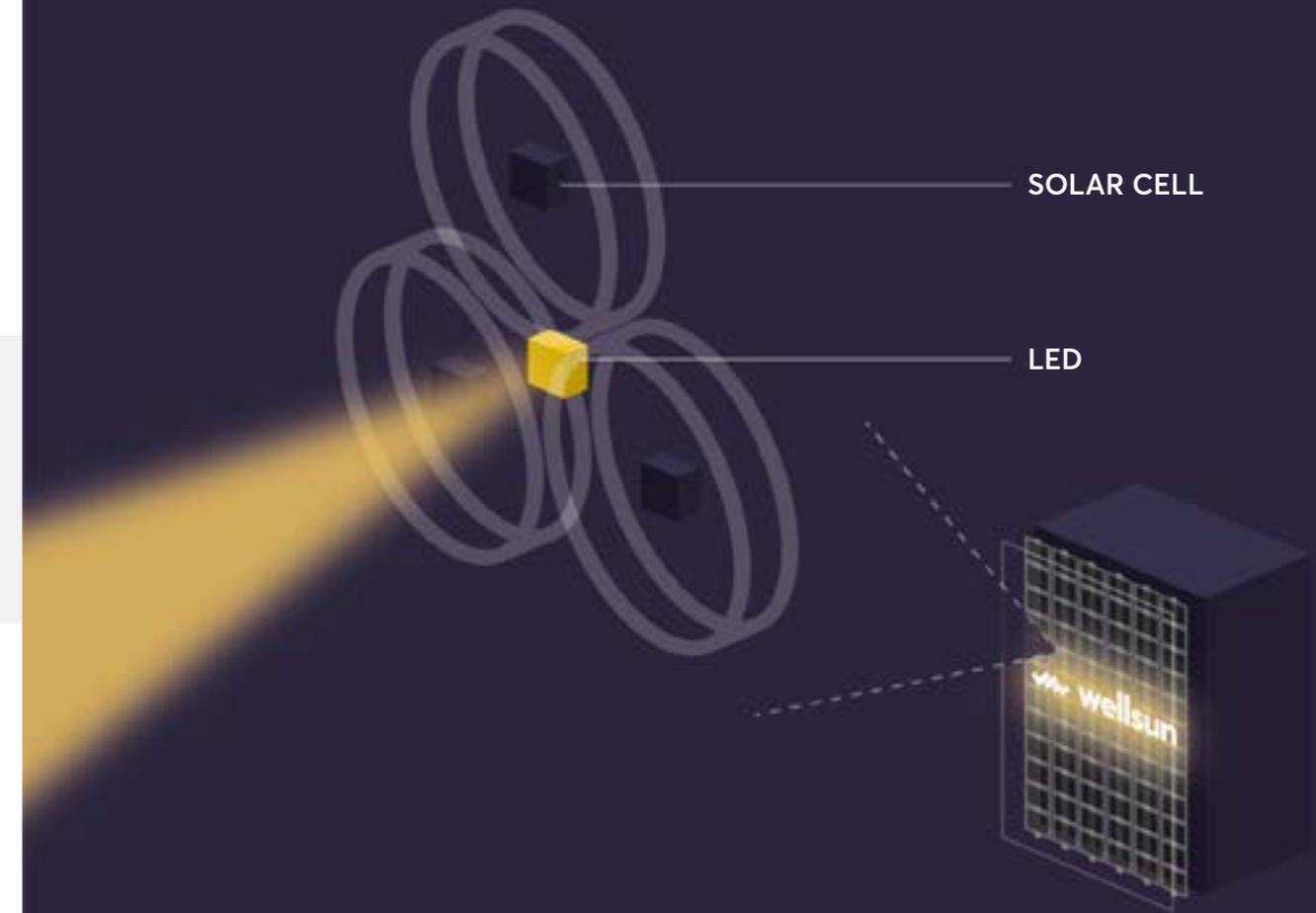


Indirect light is passed through



- > Transmits diffused daylight which naturally lights the interior
- > Blocks direct sunlight to prevent glare and overheating

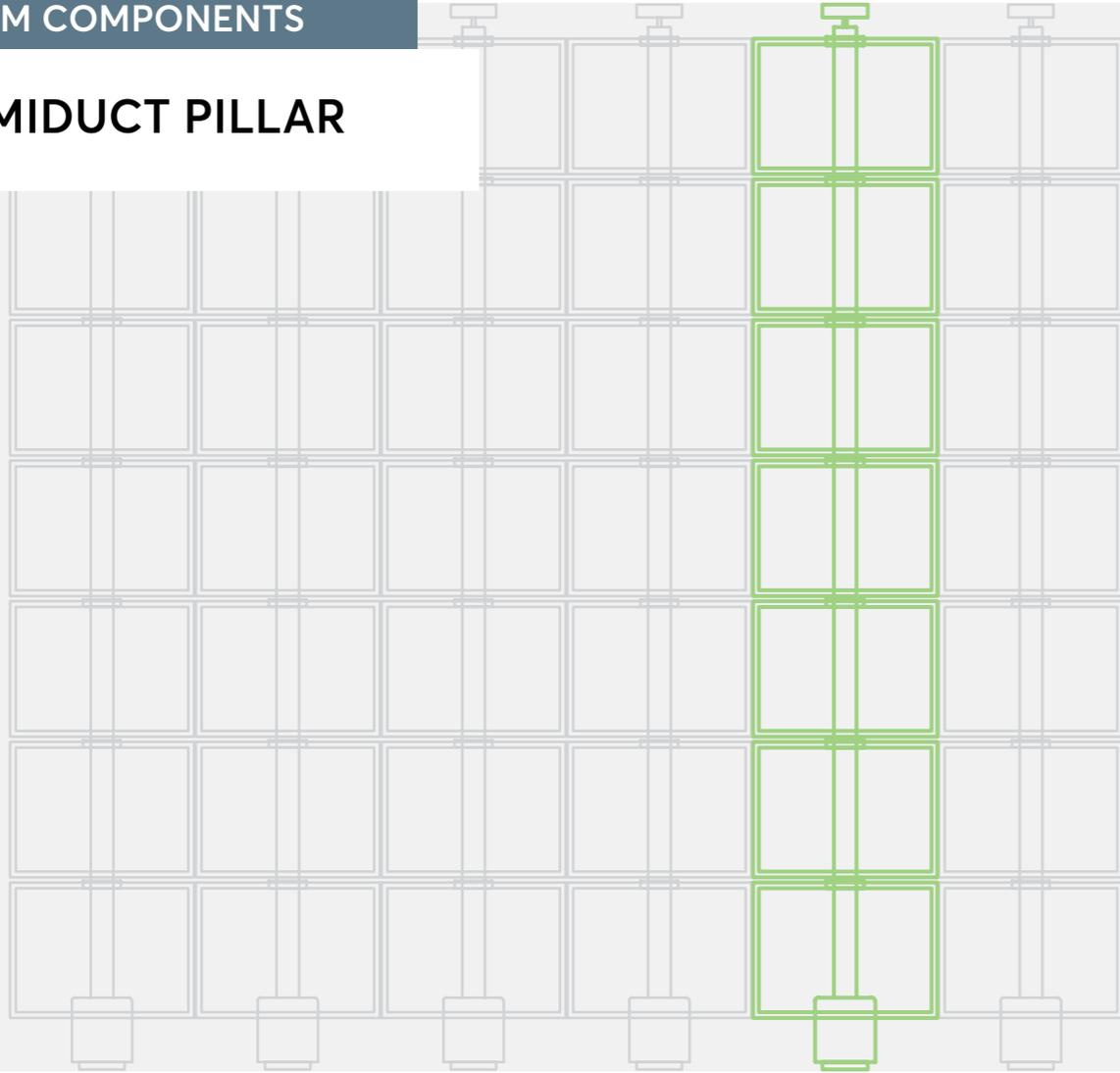
4 FAÇADE BECOMES MEDIA-WALL



- > Available with Lumiduct Media only
- > Up to 100% of the façade surface area can be used as media-wall
- > Pixel pitch is 23mm

SYSTEM COMPONENTS

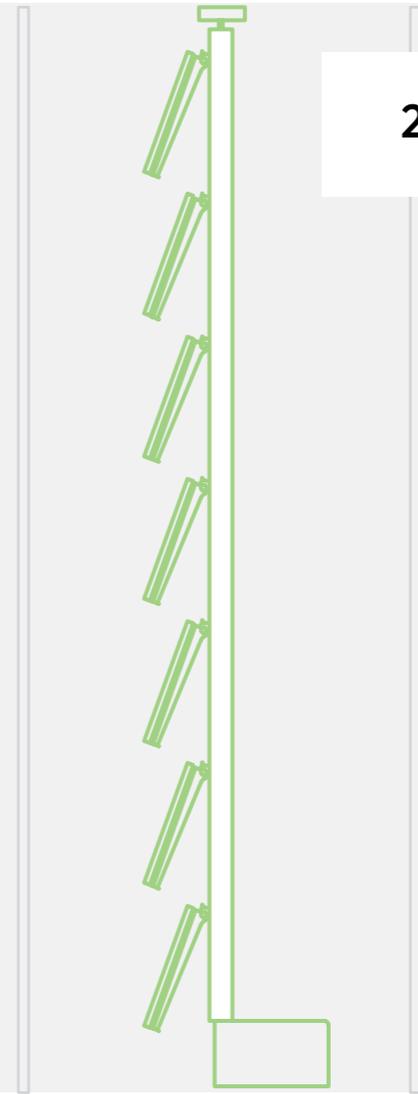
1 LUMIDUCT PILLAR



- > Number of panels per pillar can vary from 1 to 7
- > Standard pillar height up to 3.60m
- > Standard panel size is 600x426mm
- > Slim panel design of only 14mm thin
- > Project specific customization is possible

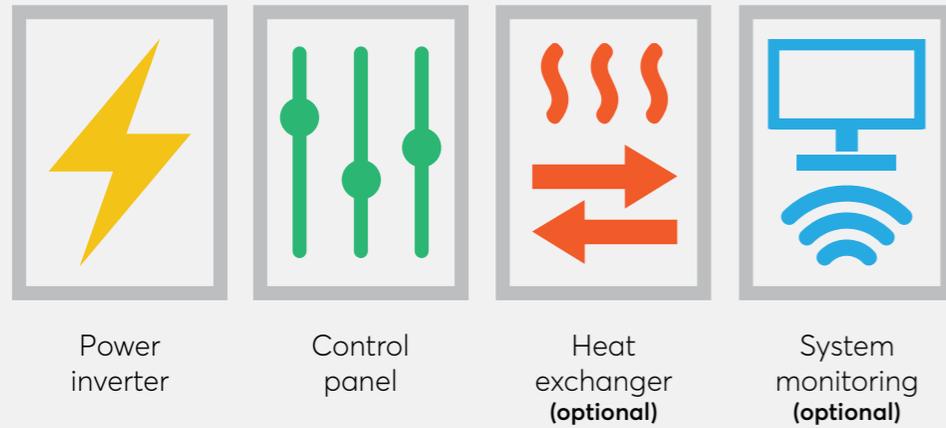


2 DOUBLE-SKIN FAÇADE



- > Climate façade for improved energy performance
- > Heat buffer for improved indoor climate
- > Sound barrier in case of noisy environments
- > Façade depth is 1m

3 SYSTEM MANAGEMENT



- > Power inverter attached to AC grid
- > Control panel for preferred operation mode for client
- > Optional heat exchanger to increase energy efficiency
- > Optional (remote) system monitoring
- > System can be connected to building management system

4 SCALABLE GRID



- > Modular design allows for complete scalability
- > Up to 100% coverage of any façade

QUICK FACTS

> The solar panels are originally developed for large-scale energy generation in the desert

> The Lumiduct is perfect for circular design because the panels are easy to re-use and are recyclable

> A great indoor climate improves productivity and reduces sick leave

> Because of the high watt peak rating, the Lumiduct improves energy labels, like EPC, significantly

> Because of the lower material shadow cost and the higher EPC score, the Lumiduct creates a significant higher BREEAM score than alternative solar panels

> The Lumiduct produces 60 kWh/m²/year in the Netherlands and up to twice as much in areas with higher solar irradiance

> This is the same energy production as a conventional solar panel mounted vertically on the façade

> Utilizing the façade frees up roof space for alternative usage



Lumiduct system properties

ENERGY GENERATION	Peak electrical power ^[1]	W/m ²	300
	Yearly electrical energy yield ^[2,3]	kWh/m ² /year	60
	Peak heat generation ^[4]	W/m ²	363
	Yearly heat generation	kWh/m ² /year	105
DAYLIGHT PROPERTIES	Direct light (glare) blockage	%	99
	Diffuse light transmission	%	70

Lumiduct module properties

POWER GENERATION	Pmpp ^[5]	W	69
	Vmpp	V	42
	Ipp	A	1.6
	Voc	V	47
	Isc	A	1.7
	Fill factor		0.87
	Efficiency ^[6]	%	30
MECHANICAL PROPERTIES	Dimensions (LxWxH)	mm	600 x 426 x 14
	Receivers per coupon	#	540
	Receiver dimensions (hexagonal diagonal)	mm	23

^[1] Based on standardized test conditions: 1000 W/m² irradiation. AM1.5 Spectrum

^[2] 85% Transmission through outer glass facade included.

^[3] Based on yearly energy yield simulations for a system located in Amsterdam, due south orientation.

^[4] Using heat pump or air/water heat exchanger.

^[5] Based on preliminary specifications provided by Morgan Solar

^[6] Aperture efficiency

Lumiduct facade properties

MECHANICAL PROPERTIES	Coupons per pillar	#	up to 7
	Azimuth tracking range	degrees °	0 - 180
	Elevation tracking range	degrees °	0 - 90
CONTROL ELECTRONICS	Input voltage	Vdc	48
POWER ELECTRONICS	Optimizer output voltage	Vdc	700

Lumiduct performance comparison

		Units	Lumiduct	Energy producing window ^[7]	Glass/silicon PV combi (70%) ^[8]	Automated horizontal blinds ^[9]
ENERGY GENERATION	Peak electrical power ^[10]	W/m ²	300	8.4	133	0
	Yearly electrical energy yield	kWh/m ² /year	60 ^[11,12]	3.8 ^[13]	60 ^[13]	0
	Peak heat generation ^[14]	W/m ²	363	0	0	0
	Yearly heat generation	kWh/m ² /year	105	0	0	0
OPTICAL PROPERTIES & COMFORT	Direct light (glare) blockage	%	99	-	70	100
	Diffuse light transmission	%	70	-	24	10
	Unobstructed view factor ^[15]	%	42	100	30	32
	Response time to change in daylight intensity	min	0	passive ^[16]	passive ^[16]	up to 15
	Fluctuation in average indoor light level when the sky conditions go from overcast to sunny ^[17]	10 ³ lux	0.6	1.9	1.9	3.2

^[7] Transparent photovoltaic film/coating applied on the glass. Window transparency close to 100%.

^[8] Mono-crystalline Silicon PV cells cover 70% of the glass surface

^[9] Lowered and raised depending on outdoor light intensity, adjusted every 2 hours

^[10] Based on standardized test conditions: 1000 W/m² irradiation. AM1.5 Spectrum

^[11] 85% Transmission through outer glass facade included

^[12] Based on yearly energy yield simulations for a system located in Amsterdam, due south orientation

^[13] Peak electrical power (Wp) * solar power generation factor in the Netherlands (0.8 kWh/Wp) * correction factor for a vertical plane, due south orientation (0.8)

^[14] Using heat pump or air/water heat exchanger

^[15] Yearly average for active systems

^[16] The system has no active components and is hence unable to respond to changes

^[17] Calculation based on light transmission properties and unobstructed view factor.

Direct sunlight intensity: 70.000 lux. Indirect intensity full sun: 20.000 lux. Indirect intensity overcast: 12.000 lux.



Wellsun uses all the sun has to offer
to make building environments more
liveable and energy efficient



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Benefits and pricing are project dependent. Contact us for a tailor-made proposal.

