



# ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	First Solar
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-2993-1671-EN
Registration number:	NEPD-2993-1671-EN
ECO Platform reference number:	-
Issue date:	06.08.2021
Valid to:	06.08.2026

## Series 6 Photovoltaic Module

First Solar



[www.epd-norge.no](http://www.epd-norge.no)



## General information

**Product:**

Series 6 Photovoltaic Module

**Program operator:**

The Norwegian EPD Foundation  
P.O. Box 5250 Majorstuen, 0303 Oslo  
Phone: +47 23 08 80 00  
e-mail: [post@epd-norge.no](mailto:post@epd-norge.no)

**Declaration number:**

NEPD-2993-1671-EN

**ECO Platform reference number:****This declaration is based on Product Category Rules:**

EN 15804:2012+A2:2019 serves as core PCR  
NPCR Part A: Construction products and services, Version 2.0  
NPCR 029:2020 Part B Version 1.1, Photovoltaic modules  
used in the building and construction industry

**Statement of liability:**

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

**Declared unit:**

1 Watt peak (Wp)\*

**Declared unit with option:****Functional unit:**

1 Wp\*


\*Life cycle impacts per initial Wp are scaled up by 7.5% to account for the average long-term degradation of the PV module over the reference service life (based on 0.5%/yr long-term degradation rate, 30 yr life).

**Verification:**

The CEN Norm EN 15804 serves as the core PCR.  
Independent verification of the declaration and data,  
according to ISO14025:2010

internal  external

Third party verifier:

  
Joep Meijer, President of the Right Environment  
(Independent verifier approved by EPD Norway)

**Owner of the declaration:**

First Solar  
Contact person: Parikhit Sinha  
Phone: 1.480.619.3960  
e-mail: [parikhit.sinha@firstsolar.com](mailto:parikhit.sinha@firstsolar.com)

**Manufacturer:**

First Solar  
350 W Washington St, Tempe, AZ 85281  
Phone: 1.419.662.6899  
e-mail: [sustainability@firstsolar.com](mailto:sustainability@firstsolar.com)

**Place of production:**

Perrysburg, USA; Kulim, Malaysia; Ho Chi Minh City, Vietnam

**Management system:**

ISO 9001, ISO 14001, ISO 45001, EPEAT Silver

**Organisation no:**

Not applicable

**Issue date:**

06.08.2021

**Valid to:**

06.08.2026

**Year of study:**

2021

**Comparability:**

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

**The EPD has been worked out by:**

Parikhit Sinha


Approved

  
Håkon Hauan  
Managing Director of EPD-Norway

## Product

### Product description:

Series 6 PV modules are characterized by reliable performance in high temperature and humidity (IEC 61215, 61730; UL 1703, 61730), extreme desert (IEC 60068-2-68), and coastal applications (IEC 61701); high lifetime energy yield based on temperature coefficient, degradation rate, spectral response, and shading behavior; glass/glass construction with anti-reflective coating; under-mount frame; no losses from light induced degradation (LID) and light and elevated temperature induced degradation (LeTID); warranted against power loss from cell cracking; hail impact certification; global PV module recycling services.

### Product specification:

Rated output: 420-450 Wp; number of PV cells: up to 264; yearly degradation rate: 0.5%/yr; technology: thin film CdTe

Materials	% by weight
Glass	84.3
Aluminum frame	11.3
Polyolefin encapsulant	2.7
Silicon-based frame adhesive	0.83
Thin film CdTe semiconductor	0.15
Polyphenylene junction box	0.13

### Technical data:

<https://www.firstsolar.com/Modules/Series-6>

Parameter	Unit	Value
Module area	m <sup>2</sup>	2.47
Module weight	kg	34.5
Average conversion efficiency*	kWp/m <sup>2</sup>	0.176 (or 17.6%)

\*17.0-18.2% conversion efficiency for 420-450 Wp

### Market:

Europe

### Reference service life (RSL), product:

30 years (LEIDOS, 2021)

### Manufacturing process:

Manufactured under one roof with 100% traceable QA/QC  
Semiconductor deposition, cell definition, and module finishing

## LCA: Calculation rules

### Declared unit:

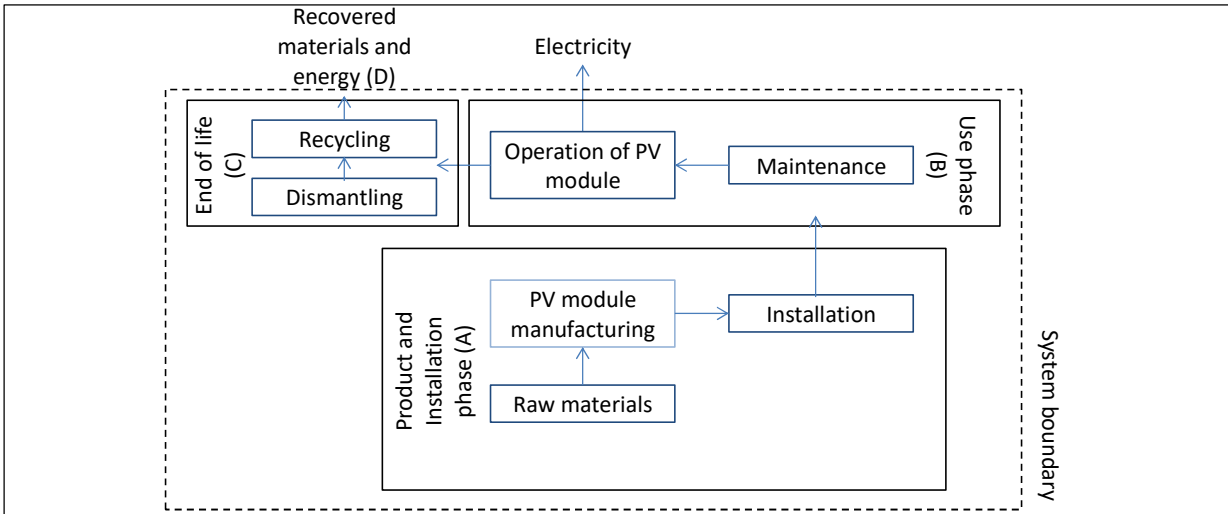
Wp

### System boundary:

A1 – D (cradle-to-grave)

Module D includes net benefits from recycled materials and exported energy.

Figure 1. Product system of a First Solar Series 6 PV module



### Data quality:

Primary data is from First Solar manufacturing facilities in year 2020 (annual average). Background data source: SimaPro 9.1.1 w/ Ecoinvent 3.6 (2019) "allocation, cut-off by allocation - unit" database. Inventory quantities have good or better data quality using pedigree matrix approach, and the Ecoinvent unit processes representing the quantities generally have fair or better data quality.

### Allocation:

The allocation is made in accordance with the provisions of EN 15804. Allocation among multiple products is not necessary as the manufacturing facility only produces one product. Effects of primary production of recycled materials allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

### Cut-off criteria:

All major raw materials and all essential energy are included. Strapping accounts for <1% of product packaging by mass and is not included. This cut-off rule does not apply for hazardous materials and substances. Long-term emissions (>100 years) are excluded and infrastructure processes are included.

## LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

The modules A1-A3 are the product stage from raw materials to manufacturing (cradle-to-gate).

### Raw materials to manufacturing (A1-A3)

Production location	Proportion of Production	Electricity usage (kWh/m <sup>2</sup> )	Natural gas usage (MJ/m <sup>2</sup> )	Water usage (m <sup>3</sup> /m <sup>2</sup> )
Malaysia (MY)	22.8%	21.7	0	118
USA	29.9%	22.6	6.31	61.0
Vietnam (VN)	47.2%	19.3	0	76.6

The module A4 refers to transport from the manufacturer to the European market via Rotterdam as receiving port.

### Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value
Truck	50%	Euro6 16-32 MT lorry	1886	kg/tkm	0.04
Boat (MY production)	100%	Container ship	14783	kg/tkm	14
Boat (USA production)	100%	Container ship	6469	kg/tkm	14
Boat (VN production)	100%	Container ship	16546	kg/tkm	14

There is minimal energy and material use during PV module installation (A5), as balance of system components such as inverters, mounting, and cabling are not included in scope. Electricity use for power tools and lifting equipment is included, an installation breakage rate of 0.36% is assumed, and waste treatment of wood pallet is modeled as 75% recycling/25% incineration. There are no material or energy requirements during the use phase (B1) of the PV module.

### Assembly (A5)

	Unit/m <sup>2</sup>	Value
Auxiliary	kg	0
Water consumption	m <sup>3</sup>	0
Electricity consumption	kWh	0.008
Other energy carriers	MJ	0
Material loss	m <sup>2</sup>	0.0036
Output materials from waste treatment	kg	0.38
Dust in the air	kg	0

### Use (B1)

	Unit	Value
None		

All modules in the use stage (B1-B7) have been assessed, but there are no impacts associated with this stage, except for maintenance (B2) and replacement (B4). There is typically no use of water for cleaning in the European market but water use for cleaning and associated wastewater treatment of the cleaning water is considered. There are no parts with reference service life shorter than the declared product. However, to account for potential PV module breakage during use, a 0.74% replacement rate over the reference service life (30 yrs) is considered, based on warranty breakage statistics.

### Maintenance (B2)

	Unit/m <sup>2</sup>	Value
Maintenance cycle	/yr	1
Auxiliary	kg	0
Other resources	kg	0
Water consumption over reference service life	L	20
Electricity consumption	kWh	0
Other energy carriers	MJ	0
Material loss	kg	0

### Replacement (B4)

	Unit/m <sup>2</sup>	Value
Replacement cycle	/yr	0.0333
Electricity consumption	kWh	0.008
Replacement of worn parts	m <sup>2</sup>	0.0074

There is no operational electricity (B6) or water consumption (B7). Annual PV module electricity production is modeled over the reference service life (30 years) for an average European installation (1073 kWh/kWp), with values for some specific countries provided. Disassembly of PV modules (C1) is based on installation (A5). The EU WEEE Directive mandates recycling and prohibits disposal of end-of-life PV modules. Therefore, 100% recycling and no waste disposal of end-of-life PV modules (C4) is considered. There was no significant difference in impacts based on sensitivity analysis of PV module recycling rate (85% compared to 100%).

### Operational energy (B6)

	Unit	Value
Water consumption	m <sup>3</sup> /m <sup>2</sup>	0
Electricity consumption	kWh/m <sup>2</sup>	0
Power output of equipment	kW	0.42-0.45
Average annual electricity production (France)	kWh/kWp	1068
Average annual electricity production (Italy)	kWh/kWp	1274
Average annual electricity production (Norway)	kWh/kWp	817

### End of Life (C1, C3, C4)

	Unit/kg	Value
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	0
Reuse	kg	0
Recycling	kg	1
Energy recovery	kg	0
To landfill	kg	0

Transport of end-of-life PV modules is modeled to First Solar's recycling facility in Frankfurt-Oder, Germany, which is an authorized waste management facility in accordance with the Ordinance on Specialized Waste Management Companies (EfBV). The products of recycling meet the depollution requirements in EN 50625-2-4:2017 and CLC/TS 50625-3-5:2017 under the collection, logistics & treatment requirements for the EU WEEE Directive, and therefore meet an end-of-waste state.

### Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value
Truck (to collection point)	50%	Euro6 3.5-7.5 MT lorry	200	kg/tkm	0.11
Truck (to recycling facility)	50%	Euro6 16-32 MT lorry	2400	kg/tkm	0.04

The net avoided burdens related to glass, aluminum, semiconductor (PV module recycling) and wood (pallet recycling) are modeled, by accounting for the benefits of displacing primary production and the loads for secondary production (D).

### Benefits and loads beyond the system boundaries (D)

Scrap	Input (kg/m <sup>2</sup> )	Primary content (%)	Input (primary; kg/m <sup>2</sup> )	Output (primary; kg/m <sup>2</sup> )	Net output (primary; %)*
Glass	1.18E+01	100	1.18E+01	1.06E+01	90
Frame	1.58E+00	26	4.11E-01	4.11E-01	100
Semiconductor	2.14E-02	100	2.14E-02	1.93E-02	90
Wood	3.75E-01	25	9.38E-02	7.03E-02	75

\*Recycling yield

## LCA: Results

Potential life cycle environmental impact according to EN 15804:2012+A2:2019 are provided per functional unit (Wp). Modules not shown (e.g., B1, B3, B5-B7, C4) are assessed but do not have non-zero results.

System boundaries (X=included, MND= module not declared, MNR=module not relevant)

Product stage			Assembly stage		Use stage							End of life stage			Beyond the system boundaries	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

### Environmental impact per Wp

Parameter	Unit	Type	A1- A3 <sup>3</sup>	A4 <sup>3</sup>	A5	B2	B4	C1	C2 <sup>4</sup>	C3 <sup>4</sup>	D
AP	mol H <sup>+</sup> eq.	Core	2.04E-03	4.23E-04	1.05E-05	7.58E-07	2.00E-05	8.80E-07	1.21E-04	6.02E-05	-5.12E-04
GWP-total	kg CO <sub>2</sub> eq.	Core	2.67E-01	3.78E-02	5.38E-03	1.21E-04	2.71E-03	1.56E-04	4.22E-02	1.98E-02	-9.69E-02
GWP-biogenic	kg CO <sub>2</sub> eq.	Core	-4.22E-03	7.41E-06	3.93E-03	3.05E-05	8.33E-06	4.57E-06	2.19E-05	1.38E-03	2.97E-04
GWP-fossil	kg CO <sub>2</sub> eq.	Core	2.71E-01	3.78E-02	1.44E-03	9.07E-05	2.69E-03	1.51E-04	4.21E-02	1.84E-02	-9.71E-02
GWP-luluc	kg CO <sub>2</sub> eq.	Core	4.07E-04	1.72E-05	1.96E-06	8.84E-08	3.40E-06	3.51E-07	1.68E-05	2.03E-05	-1.56E-04
Eco-toxicity (freshwater) <sup>2</sup>	CTUe	Additional	6.14E+00	4.43E-01	2.83E-02	3.19E-02	5.43E-02	2.13E-03	5.25E-01	2.83E-01	-2.25E+00
EP-freshwater	kg P eq.	Core	1.05E-05	2.99E-07	6.40E-08	1.14E-07	1.02E-07	1.61E-08	3.65E-07	2.62E-06	-2.51E-06
EP-marine	kg N eq.	Core	3.34E-04	1.00E-04	1.95E-06	2.51E-06	3.75E-06	1.12E-07	2.35E-05	1.28E-05	-1.24E-04
EP-terrestrial	mol N eq.	Core	3.98E-03	1.11E-03	2.27E-05	1.84E-06	4.36E-05	1.38E-06	2.64E-04	1.31E-04	-9.02E-04
Human toxicity, cancer <sup>2</sup>	CTUh	Additional	2.17E-10	1.51E-11	9.90E-13	3.49E-13	1.92E-12	5.51E-14	1.54E-11	1.15E-11	-8.39E-11

Human toxicity, non-cancer	CTUh	Additional	4.06E-09	4.15E-10	2.11E-11	9.85E-12	3.83E-11	1.88E-12	5.46E-10	1.66E-10	-1.82E-09
----------------------------	------	------------	----------	----------	----------	----------	----------	----------	----------	----------	-----------

**Environmental impact per Wp (continued)**

Parameter	Unit	Type	A1- A3 <sup>3</sup>	A4 <sup>3</sup>	A5	B2	B4	C1	C2 <sup>4</sup>	C3 <sup>4</sup>	D
Ionizing radiation, human health <sup>1</sup>	kBq U235 eq.	Additional	8.83E-03	2.25E-03	7.57E-05	8.58E-06	1.06E-04	2.72E-05	2.77E-03	8.53E-04	-1.77E-03
Land use related impacts/ Soil quality <sup>2</sup>	dimensionless	Additional	1.73E+00	2.94E-01	9.55E-03	4.72E-04	1.85E-02	7.60E-04	4.17E-01	5.03E-02	-3.19E-01
ODP	kg CFC 11 eq.	Core	1.95E-08	8.03E-09	1.44E-10	7.07E-12	2.75E-10	1.28E-11	9.47E-09	1.40E-09	-5.97E-09
Particulate Matter emissions	Disease incidence	Additional	2.23E-08	2.04E-09	1.01E-10	6.12E-12	2.04E-10	2.31E-12	2.53E-09	2.88E-10	-5.55E-09
POCP	kg NMVOC eq.	Core	1.04E-03	3.09E-04	6.04E-06	3.76E-07	1.17E-05	3.49E-07	1.01E-04	2.97E-05	-2.44E-04
ADP-fossil <sup>2</sup>	MJ	Core	3.24E+00	5.37E-01	1.92E-02	1.22E-03	3.40E-02	3.12E-03	6.34E-01	2.61E-01	-9.06E-01
ADP-minerals & metals <sup>2</sup>	kg Sb eq.	Core	6.43E-05	8.09E-07	2.39E-07	1.87E-09	4.92E-07	1.10E-09	1.35E-06	1.38E-07	-2.82E-06
WDP <sup>2</sup>	m <sup>3</sup>	Core	7.54E-02	1.52E-03	3.54E-04	5.10E-03	6.57E-04	3.48E-05	1.89E-03	9.93E-03	-1.99E-02

AP = Acidification potential, GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; ODP = Depletion potential of the stratospheric ozone layer; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

1 - This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

2 - The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

3 - The product stage (A1-A3) and product transport (A4) LCIA results are based on the proportion of production in three manufacturing locations in year 2020 (29.9% U.S., 22.8% Malaysia, 47.2% Vietnam). Sensitivity analysis of these proportions indicates a median coefficient of variation of 8% and 11%, respectively, in the LCIA results.

4 - The end-of-life stage (C) considers 100% recycling and no disposal of end-of-life PV modules in accordance with the EU WEEE Directive. In sensitivity analysis of the recycling rate with 85% recycling/15% landfill disposal, median differences in LCIA results compared to 100% recycling were -14% and -10% for C2 and C3, respectively.

**Resource use per Wp**

Parameter	Unit	A1- A3	A4	A5	B2	B4	C1	C2	C3	D
PERE	MJ	3.80E-01	5.48E-03	2.07E-03	2.11E-04	3.14E-03	6.03E-04	1.00E-02	2.88E-02	-8.26E-02
PERM	MJ	1.19E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.19E-02
PERT	MJ	3.92E-01	5.48E-03	2.07E-03	2.11E-04	2.11E-04	6.03E-04	1.00E-02	2.88E-02	-9.45E-02
PENRE	MJ	3.24E+00	5.37E-01	1.92E-02	1.22E-03	3.40E-02	3.11E-03	6.34E-01	2.61E-01	-9.06E-01
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	3.24E+00	5.37E-01	1.92E-02	1.22E-03	3.40E-02	3.11E-03	6.34E-01	2.61E-01	-9.06E-01
SM	kg	7.22E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	1.80E-03	4.96E-05	1.01E-05	1.35E-05	1.64E-05	1.87E-06	7.09E-05	3.04E-04	-7.08E-04

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

**Waste per Wp**

Parameter	Unit	A1- A3	A4	A5	B2	B4	C1	C2	C3	D
HW	kg	3.14E-05	1.18E-06	1.26E-07	1.77E-08	2.53E-07	2.07E-09	1.68E-06	7.45E-08	1.82E-05
NHW	kg	4.11E-02	1.97E-02	3.49E-04	3.08E-05	7.07E-04	1.05E-05	2.85E-02	5.11E-04	-1.22E-02
RW	kg	8.41E-06	3.58E-06	7.95E-08	6.70E-09	1.24E-07	2.22E-08	4.30E-06	2.36E-07	-2.16E-06

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

**Output flow per Wp**

Parameter	Unit	A1- A3	A4	A5	B2	B4	C1	C2	C3	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.51E-02	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.94E-04
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-03

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9.00 E-03 = 9.00\*10<sup>-3</sup> = 0.00900

**Figure 2.** Main contributors to core and additional life cycle environmental impacts

Parameter	Type	Electricity (A3)	Glass (A1)	Aluminum (A1)	Copper (A1)	Sea transport (A2, A4)	Natural gas (A3)	Solid waste disposal (A3)	PV panel factory (A1)	Pallet (A1)	Tap water (A1)
AP	Core	X	X	X	X	X					
GWP-total	Core	X	X	X	X	X					
GWP-biogenic	Core	X	X					X	X	X	
GWP-fossil	Core	X	X	X		X					
GWP-luluc	Core	X									
Eco-toxicity (freshwater)	Additional	X	X	X	X	X	X				
EP-freshwater	Core	X		X							
EP-marine	Core	X	X	X		X					
EP-terrestrial	Core	X	X	X		X					
Human toxicity, cancer	Additional			X							
Human toxicity, non-cancer effects	Additional			X	X						
Ionizing radiation, human health	Additional	X									
Land use related impacts/ Soil quality	Additional								X		
ODP	Core			X		X					
Particulate Matter emissions	Additional	X	X	X							
POCP	Core	X	X			X					
ADP-fossil	Core	X	X	X		X					
ADP-minerals & metals	Core			X							
WDP	Core			X							X

Biogenic carbon content per Wp

Parameter	Unit	Quantity
In product	kg C	0.00E+00
In packaging	kg C	1.14E-03

### Additional Norwegian requirements

#### Greenhouse gas emission from the use of electricity in the manufacturing phase

National production mix with import, at medium voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3; source: Ecoinvent 3.6).

National electricity grid	Amount	Unit
USA	0.577	kg CO <sub>2</sub> -eq/kWh
Malaysia	0.848	kg CO <sub>2</sub> -eq/kWh
Vietnam	0.480	kg CO <sub>2</sub> -eq/kWh

#### Dangerous substances

- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list
- ☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- ☐ The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list.
- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforsikten, Annex III).

IEC 62474 declarable substances and substance groups	Amount
Cadmium compounds (>0.01% by weight)	0.15% by weight

#### Indoor environment

No tests have been carried out on the product concerning indoor climate - Not relevant



#### Carbon footprint

The product stage (A1-A3) carbon footprint is 0.267 kg CO<sub>2</sub>-eq/Wp.



## Bibliography

CENELEC TS50625-3-5	<i>Collection, logistics, and treatment requirements for WEEE – Part 3-5: Technical specifications for de-pollution – Photovoltaic panels.</i>
EN 15804:2012+A2:2019	<i>Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products</i>
EN 50625-2-4:2017	<i>Collection, logistics &amp; treatment requirements for WEEE - Part 2-4: Treatment requirements for photovoltaic panels</i>
EU WEEE	<i>Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) (recast)</i>
IEC 60068-2-68:1994	<i>Environmental testing - Part 2-68: Tests - Test L: Dust and sand</i>
IEC 61215:2016	<i>Terrestrial photovoltaic (PV) modules - Design qualification and type approval</i>
IEC 61701:2020	<i>Photovoltaic (PV) modules - Salt mist corrosion testing</i>
IEC 61730-1:2016	<i>Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction</i>
IEC 62474:2018	<i>Material Declaration for Products of and for the Electrotechnical Industry</i>
ISO 14025:2010	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
ISO 14044:2006	<i>Environmental management - Life cycle assessment - Requirements and guidelines</i>
ISO 21930:2007	<i>Sustainability in building construction - Environmental declaration of building products</i>
LEIDOS 2021	<i>Independent Engineer's Report – First Solar PV Technology Review Series 6 and Series 6 Plus Modules</i>
LCI/LCA Report Version 1.2	<i>First Solar Series 6 Photovoltaic Module</i>
NPCR Part A Version 2.0	<i>Construction products and services</i>
NPCR 029:2020 Part B Version 1.1	<i>Photovoltaic modules used in the building and construction industry</i>
UL 1703	<i>Standard for Flat-Plate Photovoltaic Modules and Panels</i>
UL 61730	<i>Standard for Photovoltaic (PV) Module Safety Qualification</i>

 <b>epd-norge.no</b> The Norwegian EPD Foundation	<b>Program operator</b> The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	Phone: +47 23 08 80 00  e-mail: <a href="mailto:post@epd-norge.no">post@epd-norge.no</a> web: <a href="http://www.epd-norge.no">www.epd-norge.no</a>
	<b>Publisher</b> The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	Phone: +47 23 08 80 00  e-mail: <a href="mailto:post@epd-norge.no">post@epd-norge.no</a> web: <a href="http://www.epd-norge.no">www.epd-norge.no</a>
 First Solar.	<b>Owner of the declaration</b> First Solar 350 W. Washington St., Suite 600 Tempe AZ 85281 USA	Phone: 1.419.662.6899 Fax: 1.602.414.9400 e-mail: <a href="mailto:sustainability@firstsolar.com">sustainability@firstsolar.com</a> web: <a href="http://www.firstsolar.com">www.firstsolar.com</a>
	<b>Author of the Life Cycle Assessment</b> Parikhit Sinha 350 W. Washington St., Suite 600 Tempe AZ 85281 USA	Phone: 1.480.619.3960 Fax: e-mail: <a href="mailto:parikhit.sinha@firstsolar.com">parikhit.sinha@firstsolar.com</a> web: