

Photovoltaic industrial roofs in China

ilum 意路姆
意大利 新能源工程技术

ilum 意路姆
意大利 太阳能工程技术

Italian engineering
company

PV plants in Europe
since 2006

ilum 意路姆

In 2014 China started
Feed In Tariffs
(F.I.T.) for
Photovoltaic
Rooftop powerplants



China PV
incentive is

very
generous

Since 2015 Ilum provides
photovoltaic rooftop powerplants
on industrial buildings in China



Income

220 000

€/MWp

(around 1.5M RMB/MWp)

each year X 20 y



5th year investment repaid!

(After 5 years)

Stable income

For 15 years ahead



[After 20 years]

You keep enjoying

electricity for free

[F.I.T. over]

ILUM
2 services

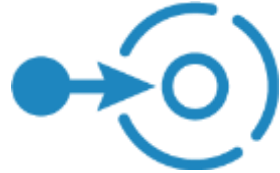


EPC

Engineering, Procurement, Construction

Self owned plant: produce your own green energy

**YOU OWN
THE PLANT**



PPA

POWER PURCHASE AGREEMENT

Provide your rooftop to get discounted green energy

WE INVEST

ilum 意路姆

意大利 - 新能源工程技术

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Summary



Feed In Tariff (FIT)



Advantages



Illum Services



Illum Structure



F.I.T.
feed in tariff

PV is getting easy!



- 2009-2012** Only **land installation** with subsidized construction under **"GOLDEN SUN"** policy
- 2009-2012** **Implementation process** flaws caused **unsuccessful cases** such as developers who collected the subsidy from the government but failed to deliver the projects
- 2013-2015** Land installation policy changed into **FIT based on real amount of produced electricity**
- 2014** Government launched the **Distribute Generation [DG roof plants]** with a fixed FIT but **installation quota** and **local hierarchy policies limited** the installations
- 2015** In order to speed up DG roof plants the central government **removed the quota** and **simplified the authorization** processes

0,42 National
Contribution
x20 years
RMB/kWh
[0,06€]



Local Contribution

0,25
0,036€ RMB/kWh
Beijing x5y

0,25
0,036€ RMB/kWh
Shanghai x5y

0,10
0,036€ RMB/kWh
Guangzhou x10y

0,90

Electricity
Saving

RMB/kWh

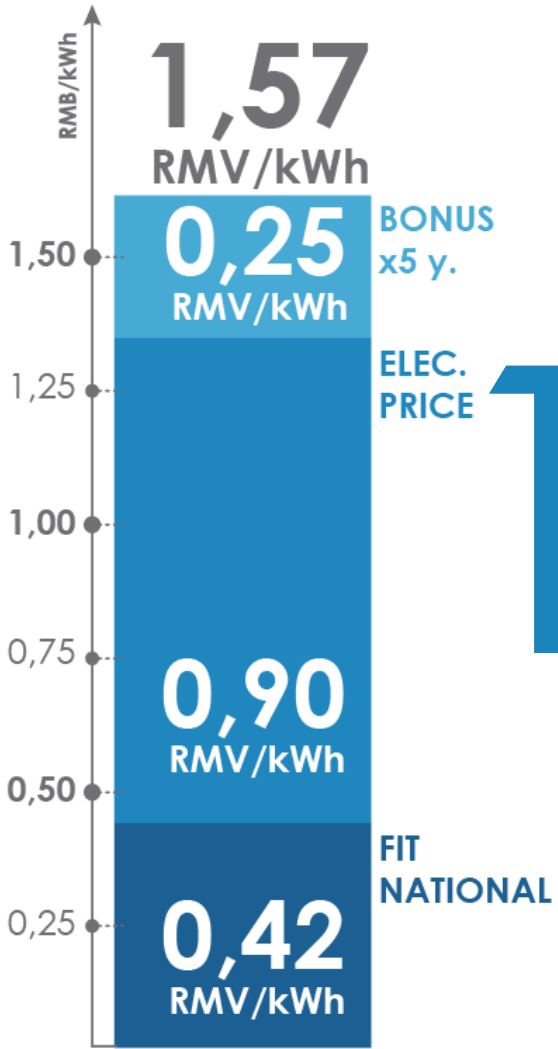
[0,13€]

0,47

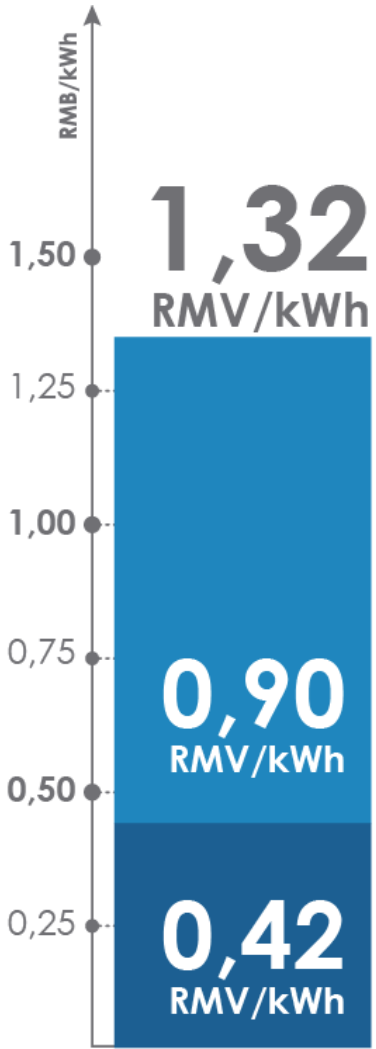
[0,07€]

Sell the energy
to the grid

RMB/kWh



1,57 Income for self consumption
y1 -y5 + local RMB/kWh contribution
[0,23€]



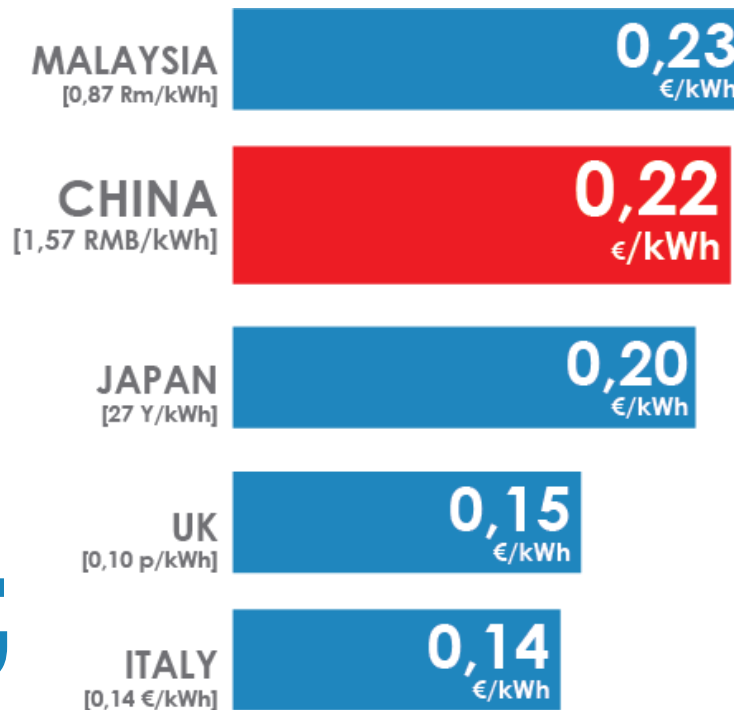
ELEC.
PRICE

1,32
[0,20€]

Income for self
consumption

y6-y20
RMB/kWh

China income
for rooftop
power plants
is one of the
biggest

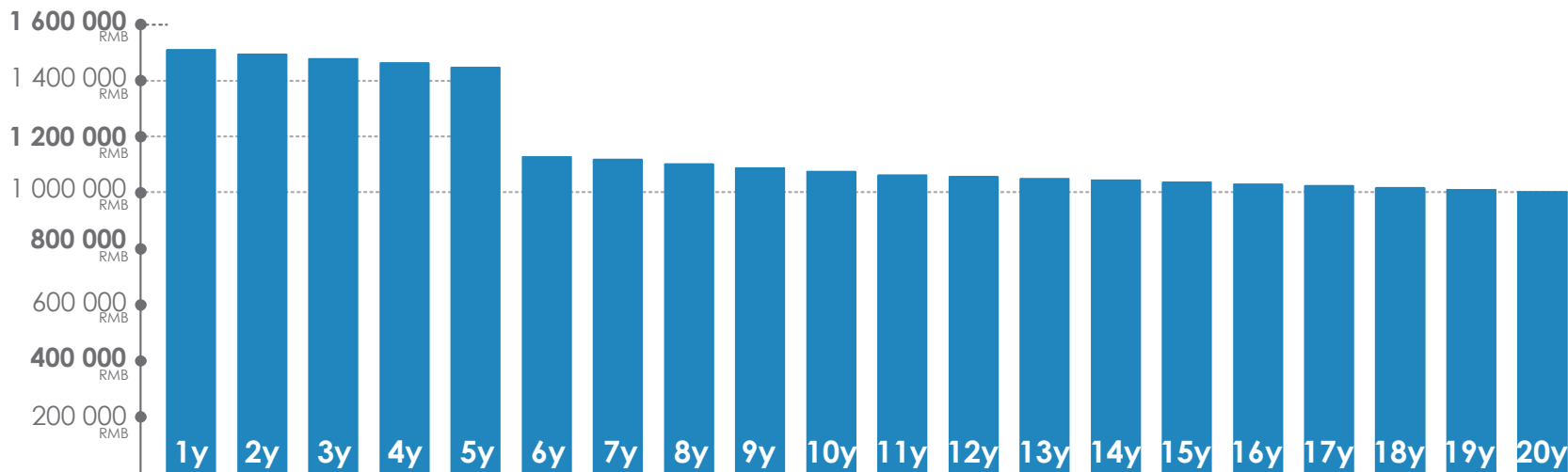


1,5 MRMB

(220 000 €) yearly income



EBITDA (Revenues-Expenses) 1 MWp



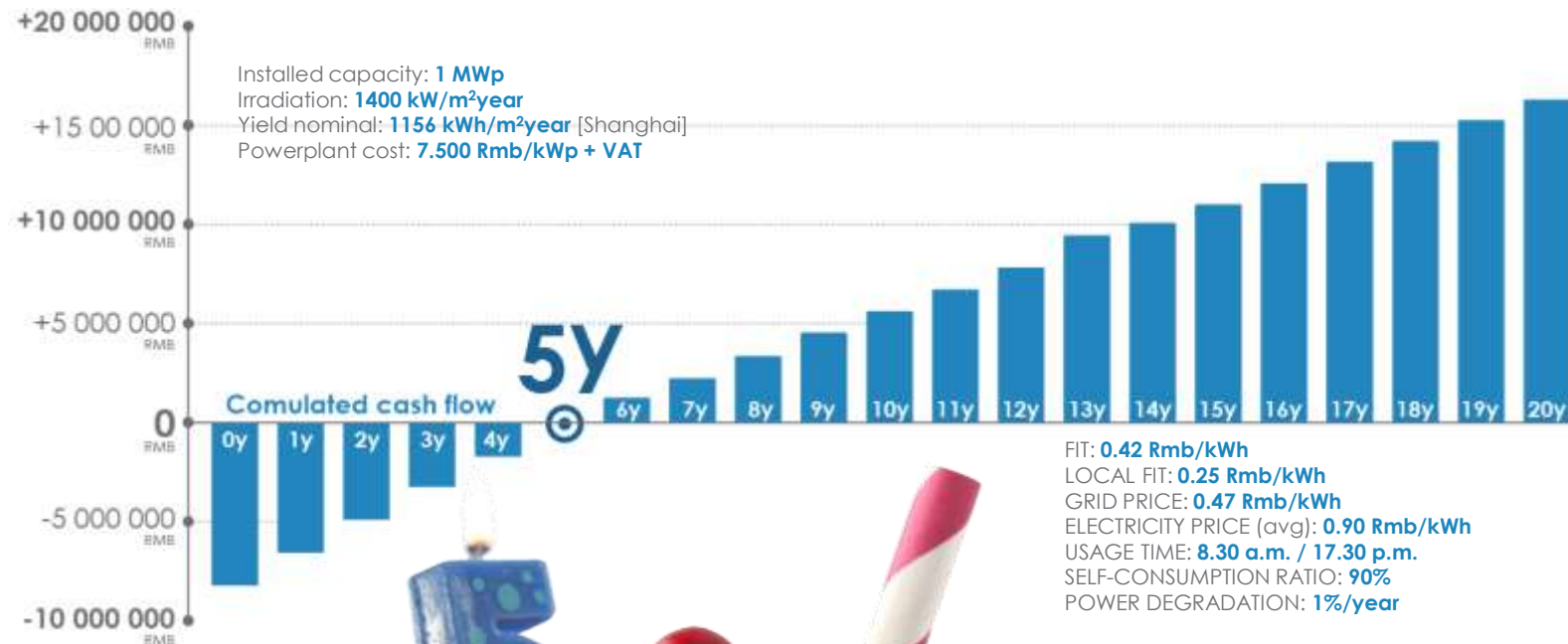
Installed capacity: **1 MWp**
 Irradiation: **1400 kWh/m²year**
 Yield nominal: **1156 kWh/m²year** [Shanghai]
 Powerplant cost: **7.500 Rmb/kWp + VAT**

FIT: **0.42 Rmb/kWh**
 LOCAL FIT: **0.25 Rmb/kWh**
 GRID PRICE: **0.47 Rmb/kWh**
 ELECTRICITY PRICE (avg): **0.90 Rmb/kWh**
 USAGE TIME: **8.30 a.m. / 17.30 p.m.**
 SELF-CONSUMPTION RATIO: **90%**
 POWER DEGRADATION: **1%/year**

YEAR CASH FLOW Y1: **1.513.933 Rmb**
 YEAR CASH FLOW Y20: **1.009.000 Rmb**
 CUMULATED CASH FLOW Y20: **16.154.000 Rmb**
 IRR (full equity): **17.0 %**



Cash flow projection - 1 MWp



YEAR CASH FLOW Y1: 1.513.933 Rmb
YEAR CASH FLOW Y20: 1.009.000 Rmb
CUMULATED CASH FLOW Y20: 16.154.000 Rmb
IRR (full equity): 17.0 %

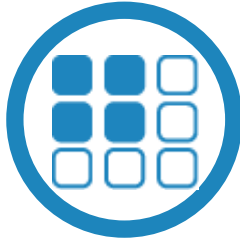
Net income based on roof size



3 000 sqm

ROOFTOP of 3000 sqm

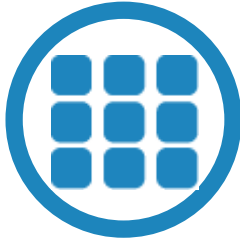
MWp **0,3**
MWh/year **346,8**
RMB/year **454.180 ¥**
€/year **66.791 €**



10 000 sqm

ROOFTOP of 10 000 sqm

MWp **1**
MWh/year **1.156**
RMB/year **1.513.933 ¥**
€/year **220.637 €**



20 000 sqm

ROOFTOP of 20 000 sqm

MWp **2**
MWh/year **2.312**
RMB/year **3.027.866 ¥**
€/year **445.274 €**



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意大利·船舶工程

JUICY ADVANTAGES

ROE
avg y6-y20

16%

ROE 20%
avg y1-y5



365 days

Production no stop

ZERO

Interference with your
factory's activity

ZERO

VOLATILITY

20 YEARS
STABLE
INCOME



Carbon impact of the product as a plus for promotion



Interface
Carpet world leader company

Environmental Data Sheet - Heuga 530

Interface®

Construction

Yarn system 100% BCF PA 6.6

Backing system Graphlor®

Recycled Content

Total	Pre consumer	Post consumer
46,24%	46,24%	0,00%

Product average

46,24%

46,24%

0,00%

Interface®

Carbon Footprint

Global Warming Potential (kgs CO₂ equivalents/sq meter)

Full life-cycle carbon footprint
(following our EPD results or
EPD calculation method)

Raw materials and Production:	10.0 kg CO ₂ eq./m ²
Delivery and installation:	0.31 kg CO ₂ eq./m ²
Use (10 years):	2 kg CO ₂ eq./m ²
End of life (waste to energy):	4.5 kg CO ₂ eq./m ²
TOTAL (10 years' lifetime):	16.81 kg CO₂ eq./m²

CO₂ compensation

Carbon neutral Cool Carpet® is optional



Installation waste

Recycling - 20% to installation waste

For reference: 2 metre wide broadloom typically generates 7-10 % installation waste

* In a rectangular building, installed before walls

End-of-life

Repair: Can be cleaned and repaired in a non-critical location to extend its useful life

Alternatives to landfill

Recycling: Can be returned through the Interface ReEntry scheme and be re-used as raw material in new carpet tiles

Actually

A lot of Companies are developing

**low carbon
products**

CDP «Climate action and profitability: CDP S&P Climate Change Report 2014»



Carbon free
products are
much **more**
attractive



CDP «Climate action and profitability: CDP S&P Climate Change Report 2014»

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Microsoft



L'ORÉAL PARIS



Goldman Sachs



Mercedes-Benz



TOYOTA





Cut the **20%** of emissions in China since 2008

Developed **300+** renewable energy projects worldwide





2 solar farms of **20 MWp** each in China

Powered by **87%** of renewable energy worldwide





383 MW_p installed capacity on all Ikea Store in China

100% of distributor centers in China are powered by PV plants





ilum 意路姆
意大利·高新技术工程服务



31.4 MWp rooftop powerplant on facilities in Foshan-Guangdong





3.5 MWp rooftop powerplant on facilities in Zhuhai - Guangdong



ILUM



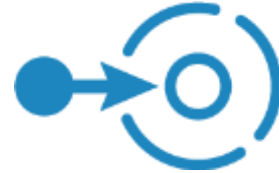
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Engineering, Procurement, Construction

Self owned plant: produce your own green energy



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POWER PURCHASE AGREEMENT

Provide your rooftop to get discounted green energy

**YOU OWN
THE PLANT**

WE INVEST



E.P.C.

Engineering, Procurement, Construction

Self-powered factory!



E.P.C.

Engineering, Procurement, Construction



YOU PUT MONEY



WE SUPPLY EVERYTHING
(authorization, design,
construction, connection)



YOU OWN THE PLANT

E.P.C.

Engineering, Procurement, Construction



F.I.T.

Feed in Tariff
For 20 years



FREE ELECTRICITY

Power generation during
day-light hours



SELL ENERGY

Sell extra-energy to the
grid

E.P.C.

You invest in your **roof**
and you get a
constant source of
profits
for your company



P.P.A.

Power Purchase Agreement

Go Green for free!



P.P.A.

Power, Purchase, Agreement



WE PUT MONEY



**WE TAKE CARE OF
EVERYTHING**

(authorization, design,
construction, connection)



**YOU GET DISCOUNTED
ELECTRICITY**

+

LOW CARBON FACTORY

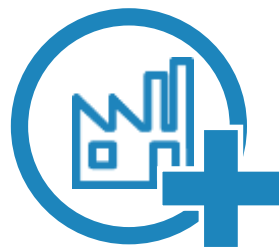


P.P.A.

With No upfront investment:



Increase the value of your
products



Increase the value of your
building



Decrease your energy
expenses

P.P.A.

NO
worries



P.P.A.

No Worries



No interference with your regular factory activities



No holes on your roof, panels are fastened with clips



All safe: Activities are always covered by our insurance

P.P.A.

Easy Wayout



If you **change location**, you can **transfer** the PPA **to the next user**



After 25 years we **remove** everything **and dismiss** the plant



P.P.A.

In 3 months you have
carbon free factory...

10% Simply, you pay less

The **price is linked** to your normal energy **bill price**



Ilum

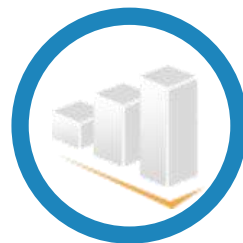
is an Italian
Company with an

office in
Shanghai

ILUM
Italy



ILUM – 10 years
expertise in
photovoltaic
installations



**SISTHEMA
ENGINEERING**
engineering design
and technical
support



SOLEVENTO
powerplant
construction and
commissioning

ILUM Partners China



ILUM – 10 years
expertise in
photovoltaic
installations



K3E – 10 years
engineering
expertise in
Chinese Market



**CHINA SOUTHERN
POWER GRID**

One of the 5 state-
owned enterprises in
China

as illum in 10 years





50 MWp

Installed in Europe



PV case history

ILUM headquarter – Brescia, Italy

Installed capacity: **50 kWp**
+ roof tracking system

ILUM operations



powerplant design &
authorization



tracking system design



powerplant construction
& commissioning



operation &
maintenance



PV case history

Brescia, Italy



Installed capacity: **1 MWp**
+ industrial consumption optimization

ILUM operations



powerplant design & authorization



Installing consumption re-planning



powerplant construction & commissioning



operation & maintenance

4

Structure

PV case history

Brescia, Italy

Installed capacity: **50 kWp**
Floating tracking system

ILUM operations



powerplant design &
authorization



tracking system design



powerplant construction
& commissioning



operation &
maintenance



PV case history

Brescia, Italy



Installed capacity: **700 kWp**
+ industrial consumption optimization
+ powerplant areas efficiency matching

ILUM operations



powerplant design & authorization



Installing consumption & efficiency matching



powerplant construction & commissioning



operation & maintenance

PV case history

Brescia, Italy

Installed capacity: **200 kWp**
+ asbestos removal - roof replacement

ILUM operations



powerplant design & authorization



Asbestos removal operation management



powerplant construction & commissioning



operation & maintenance



PV case history

Trani, Italy



Installed capacity: **1 MWp**
+ industrial consumption optimization
+ powerplant areas efficiency matching

ILUM operations



powerplant design & authorization



Installing consumption & efficiency matching



powerplant construction & commissioning



operation & maintenance

PV case history

Romania

Rascaieti - Romania

Installed capacity: **2.5 MWp**

ILUM operations



powerplant design & authorization



project financing



powerplant construction & commissioning



operation & maintenance



PV case history

Apullia, Italy



Installed capacity: **1 MWp**

ILUM operations



powerplant design &
authorization



powerplant construction
& commissioning



operation &
maintenance



150MWp
Industrial solar roofs in China

[only in 2015]





中国南方电网

CHINA SOUTHERN POWER GRID



ACTIVITIES

Investment
construction
operating power grid



ELECTRICITY SALES in 2014



REVENUES in 2014 [74,09 Billion \$]



TOTAL INSTALLED POWER in China





中国南方电网

CHINA SOUTHERN POWER GRID



ACTIVITIES

invests,
constructs,
operates power
networks



SQUARE KILOMETERS OF AREA COVERED



PEOPLE CONNECTED



KILOMETERS OF GRID



PV case history

Guangzhou, China

Installed capacity: **1 MWp**

CSG Synthesis Energy operations



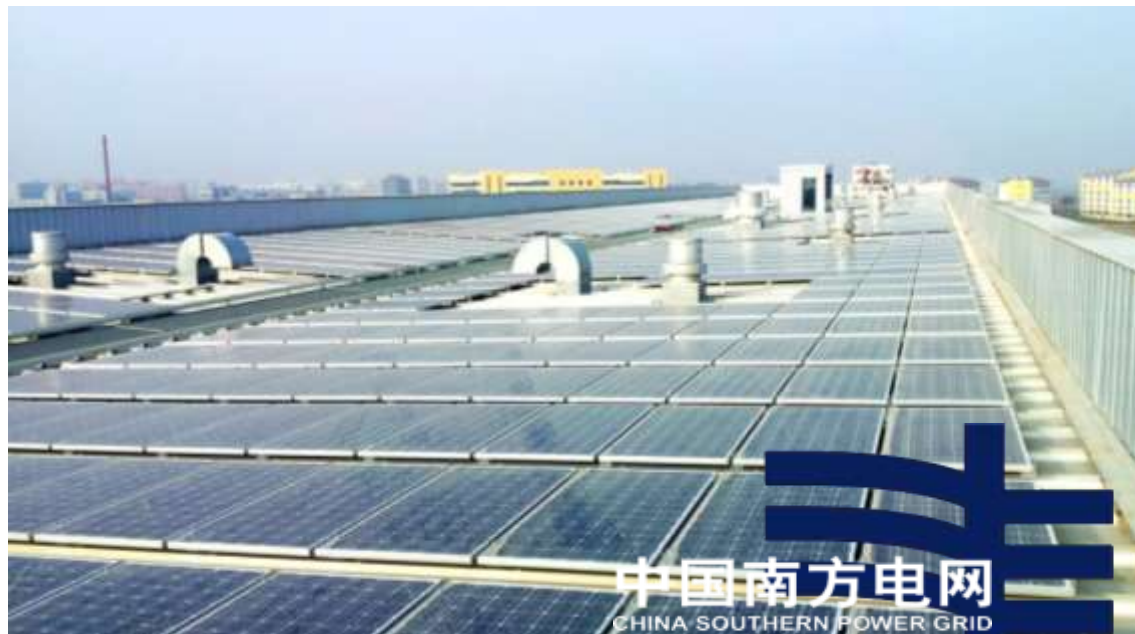
powerplant design &
authorization



powerplant construction
& commissioning



operation &
maintenance

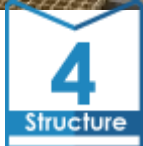
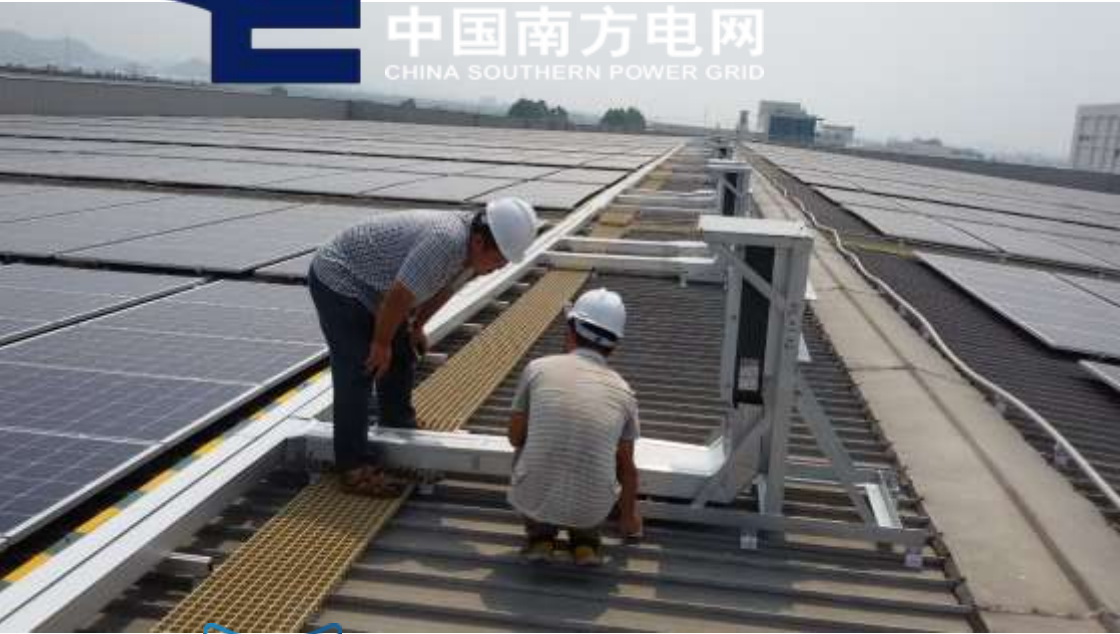




PV case history

Zhuhai, China

中国南方电网
CHINA SOUTHERN POWER GRID



Installed capacity: **3,5 MWp**

CSG Synthesis Energy operations



powerplant design &
authorization



powerplant construction
& commissioning



operation &
maintenance

PV case history

Jiangmen China

Installed capacity: **4,3 MWp**

CSG Synthesis Energy operations



powerplant design &
authorization



powerplant construction
& commissioning



operation &
maintenance



中国南方电网
CHINA SOUTHERN POWER GRID



PV case history

Guangzhou, China

中国南方电网
CHINA SOUTHERN POWER GRID



Installed capacity: **31,4 MWp**

CSG Synthesis Energy operations



powerplant design &
authorization



powerplant construction
& commissioning



operation &
maintenance

4

Structure

Together:

we take care
of everything!

Feed in tariff has
just started
It's a great
opportunity





ilum

brings it on

Thank you!



Contacts

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