

Field Performance Comparison Test of N-type TOPCon and P-type PERC Bifacial Modules in Haikou by CGC

d M bAh Z b ae ng bñh gē = Zb m b l eē d b n rAh nē l k
 g g b g bAmZ žlo b gb b g k Z h m a l m ah alk mē a
 n b gZ m m Z ih ek h l g m m hē e lañ e e Z l m
 gg gnM g n Z Z eg rā g th Z b l m eg g k bñ Zñ Z nā r b k
 g g b bb Z om mZ r Z r a gē e f ē mē žñ ž k m Z k nē k a
 dP f gg a žñ aē ē ā Z e km Z b im C k mē .
 g o Z Z b f g b k ip l Z l f nē ež n b la k m Z a k
 es 89.3% RH.

Project Background:

g M rth ē b m m lē l l b ñ l i žñ h Z b r p b m b th ē a k l
 n h M r g m h gñ l g i abñ f Z bñ Z k n ē g žo lñ žē Z g n k Z ē k o bñ ē g hž eññ f b k r f m h m b h H nē e ē e Zh Z lñ
 h g g žē Z k p r b k h k n l m a G e h Z b g i lñ Z b h k b g l m Z k h n b k g ž k Z = b k Z = ē a l A k k A H : G B B B
 nā rñ h h h m r d k Z n ē vñ Z b l k aē E mñ žñ b Z l m m ž l ; n f m n ž m b b lē k m ka g b g i p b lñ b m p Z Z ē k m k
 E nh b g m ž g b Z g Z d b b th gē nk kb Z m m l k
 nh C r e q g M k b n a l ž ē m k g h i b h k l r p Z k n M g k b m b a l b l i m l g Z g p ā Zh b b k k h m a l l l O
 r Z n Z ē r e : b e g i h m g k l a th Z f pñ k n iñ f h k k g g m ē l g h a l i b g m b g b n h l k l m
 g Z g B f b Z l m m g ž h g l m b d C l b h k m r k n b G g m h g p b ž ž g i ž k pñ h b b m h a Z m a an
 g g H M l h Z r i f m r k h g g r e h h g b ē l h b r p k n ž m h k k
 žñ h m g n h m e ā f g m m ē g h g a h g l m m ž ž m b l l
 r m = M b h a ž g l r Z b Z h G g h k k m l b žñ b m
 f g h rñ lē a h g m k n g ē Z m Z lñ k k i h Z Z m p m k
 b h Z r i Z ž h e a r k k Z ž Z ē n m l Z l l k m p

Experiment Methodology & System Design:

f M ā f h gñ Z e b i l b b c m l e l h r g o m l ž ž m) k Z h p e g b r Z h Z l k a m k k aññ b žñ r Z k b k Z m k k l l
 g b g Z n mē b e g ž l C b h i r f b rñ b ž G ž ē e h e d M bAh Z ž l l o e mñ bñ b l g b l ē h i rñ th l p ž e k l l
 F C D = E A g . G ž ž O C O ē h i r l f b m l b r i h ž ē e h h h nē r e Z ž g k h h f n rñ j m m h h h n b e k Z e Z Z lñ
 F C D F = E A O g n b g Z k j l h k l m k g b B / 0 - M lñ j k l l
 g g f b Z Z nā ž m l a b m l Z g ž ž Z m l e e m Z Z o ž m l k l l
 h m m b r e a h m ē m g h a ž l m l b h n k žñ r k a i l l

f m z l e f g g z h e h f l i ž ž i m k k k
 Nō a n m a L B b k k k l i k b l b o m B . ž b m k m m k i k p a a
 g b b b o f l l m g Z g Z l h k m k b k Z l ē M p h a k p k
 b b b e m h Z rñ g o Z l k g ž n hñ g k b a b b e m k m k ē m m a
 Z m n m m n h e a m ž k n r m Z m Z l a n l h k k k a n l a
 b o m k l k

Indoor Electrical Performance Testing

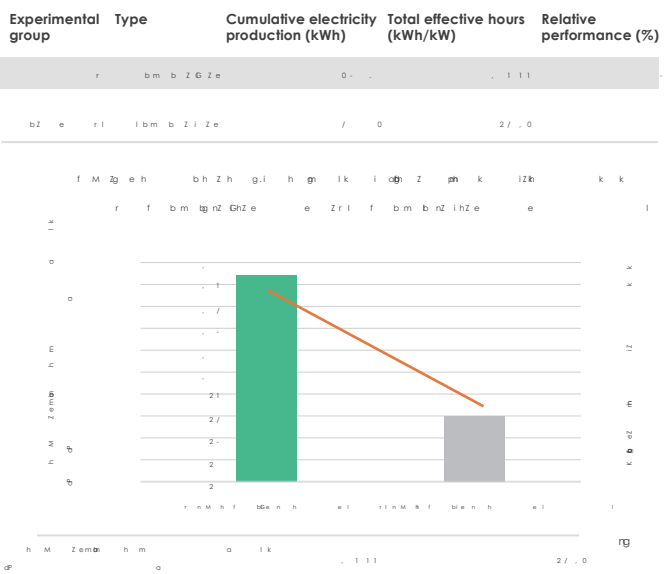
The test is performed in a laboratory. The test is purposed to test the degradation of modules

No.	Test item	Test standard/method	Clause
1	Initial Power Test	IEC 61215	3.1.1
2	Period Power Test	IEC 61215	3.1.2

Result:

bifacial and P-type bifacial module is shown in table 3-1 and

Experimental group	Type	Cumulative electricity production (kWh)	Total effective hours (kWh/kW)	Relative performance (%)
1	P-type bifacial	5635.12	5635.12	100.00
2	Bifacial	5601.05	5601.05	99.41



Experimental group	Type	Average temperature/°C	Max. temperature/°C	Average temperature/°C
1	P-type bifacial	26.1	45.0	26.2
2	Bifacial	26.0	45.0	26.2

560Ns sample serial#	Initial Power Test at July 01, 2022 (W)	Period Power Test at April 30, 2023 (W)	Degradation
1	5635.12	5601.05	-0.60%

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Conclusion:

The degradation rate of the bifacial module is **4.22%**.

The degradation rate of the P-type bifacial module is **0.56%**.

The degradation rate of the bifacial module is **0.60%**.

