

The logo for TrinaTracker, featuring the word "Trina" in white with a red dot above the 'i', followed by "Tracker" in white. The background is a blue gradient with a red bar at the top.

**TrinaTracker**

The title "Trina Smart Tracking Technology" in white text, centered on a blue background. The background features a grid of white lines and a network of blue nodes.

Trina Smart  
Tracking  
Technology

The product code "31 Z [fWBSbWd a` EgbWdF dSU]" in white text, centered on a blue background. The background features a grid of white lines and a network of blue nodes.

31 Z [fWBSbWd  
a` EgbWdF dSU]

The logo for SinerTrack, featuring the word "Siner" in white and "Track" in red. The background is a blue gradient with a red bar at the top.

**SinerTrack**

# Contents

## 1. Abstract

# 3TTdWh[Sf[a` e

# ;` fcbVgUf[a`

## 2. Background

\$# ;` fcbVgUf[a` aXUa` hW f[a` S^fdSU [` Y S^Yad[fZ\_

\$ \$ 6W[U[W U[W e aXUa` hW f[a` S^fdSU [` Y S^Yad[fZ\_

## 3. Definition and Main Value Points of SuperTrack

## 4. Introduction of SuperTrack Algorithm

&# FdSU [` Y S` Y^Wabf[\_ [l Sf[a` EF 3 XadZ [YZ V[XXgeW[ddSV[S` UW

i WsfZWd

&\$ 4SU] fdSU [` Y S` Y^Wabf[\_ [l Sf[a` E 4 3 XadUa\_ b^W fWddS[

## 5. SuperTrack System Architecture

## 6. Test Data and Gain Simulation

( # FWef 6SfS

( \$ 9S[ bafW f[S^Wef[\_ Sf[a` S` V fZ [dVZbSdfk hWd[X[USf[a`

## 7. Conclusions

# 1 Abstract

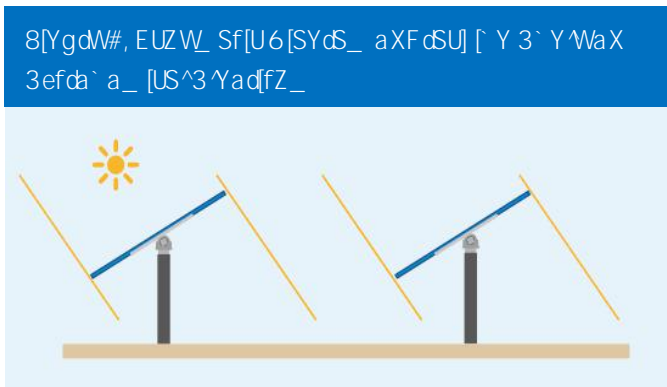
EF

3f bdMēW fī fcdSU] Wde ZShWVW\_ a` efdSfW [fe SVhS` fSYWē ahVdXj] VW efdgUfgdWē a`  
VhWf] VW Uaef aXW Wdyk />5A 7fiXadbZafaha fS[Ubai WdefSf[a` ež3e\_ aVg WfWUZ` a`aYk  
TWUa\_ Wē [ UdMSe[ Y`k \_ SfgdW fZWdW [e fff`W daa\_ Xad Uaef dWgUf[a` fZdagYZ  
fWUZ` a`aYk [\_ bcahW\_ W f- ? SfVd[S^Uaef ZSe` a fdW V fa Ya Vai ` i SdV S` V fZWdW[e  
VhW S dVTag` V fdW V aUSe[a` S^kž 3^fZaeWXSUfade VVfVd\_ [ Wē fZW\_ badfS` UWaX  
fWUZ` a`aY[Wē fa YW WdSfW\_ adW/W Wdyk YS[ t i Z[UZ i [^Ua` fd[Tgfwfa Z[YZWd;DD S` V  
`ai Wd >5A 7ž 5a\_ bSdW fa Xj] VW efdgUfgdW fcdSU] Wd US` VXXWUf[hWk [\_ bcahW bai Wd  
YW WdSf[a` ea Se fa \_ S[ fS[ S`ai Wd >5A 7ž 3Ulad[ Y fa 4`aa\_ TWdyie egchWk fZW>5A 7  
aXfcdSU] Wde i adVi [VWZSe TWW `ai Wd fZS` fZSf aX Xj] VW efdgUfgdWē e[ UWfZWeWUa` V  
ZS`XaX\$" \$" ž

3 fZagYZ fZWbWdXad\_ S` UWaX fcdSU] [ Y ekefW\_ fZSf geWē Ua` hW f[a` S^fcdSU] [ Y  
SYad[fZ\_ ZSe TWW [\_ bcahWf [ adVd fa [ UdMSeWfZWSVSbfST [f`k aXfcdSU] [ Y ekefW\_  
fa g` VhW fVdS[ t [\_ bcahWfZWbai WdYW WdSf[a` g` VVdV[XXWdW f i WdSfZVdUa` V[f[a` et  
S` V Vy bS` V fZW Sbb [USf[a` eUW Sd[ae aX fcdSU] [ Y ekefW\_ t e\_ Sd[ fcdSU] [ Y SYad[fZ\_  
W\_ WdyWēž

# 2 Background

## 2.1 Introduction of conventional tracking algorithm



FZW Ua` hW f[a` S^ f dSU] [ Y  
S`Yad[fZ\_ Ua` e[e]e aX fZW  
Sefcb` a\_ [US^S`Yad[fZ\_ S` V fZW  
TSU] f dSU] [ Y S`Yad[fZ\_ ž FZW  
eUZW\_ W [e UZScdSURVd[| WW Tk  
e[ b`WUa` fcb` ^`a`Y[U S` V efdcb` Y  
W Y[ VWd[ Y b dSUF[UST[|fkt| ea

fZSf [f [ei [VWk geW [ fZWZad| a` fS^e[ Y`WSj [e f dSU] [ Y ekefW\_ ž

AX i Z[UZ| fZW Sefcb` a\_ [US^S`Yad[fZ\_ dVWd| fa fZWS`Yad[fZ\_ fZSf aTfS[ e `aUS^  
`a` Y[f]gVW S` V `Sf[f]gVW f[ W S` V afZWd [ Xad\_ Sf[a` TSeW a` fZW ea` SdZfWdVef d[S^  
dWSf[a` eZ[b fa US`Ug`SfWfZWdWSf[hWbae[f[a` aX fZWeg` /ZVZ fZW[ U[VW UWS` Y`WaX  
ea` SddSkef| S` V fZSf YWfe fZWfZWdVf[US^Zad| a` fS^e[ Y`WSj [e f dSU] [ Y S` Y`WSUadV[ Y  
fa fZWbd[ U[b`WfZSf fZWe\_ S`Vd fZWS` Y`WTWfi VW fZW` ad\_ S^hWUfadaX\_ aVg`WS` V  
[ U[VW f ea` SddSkef fZWZ [YZWd fZW[cdSV[S` UWdWU[hW Tk fZW\_ aVg`WZ8[YgdW#fi

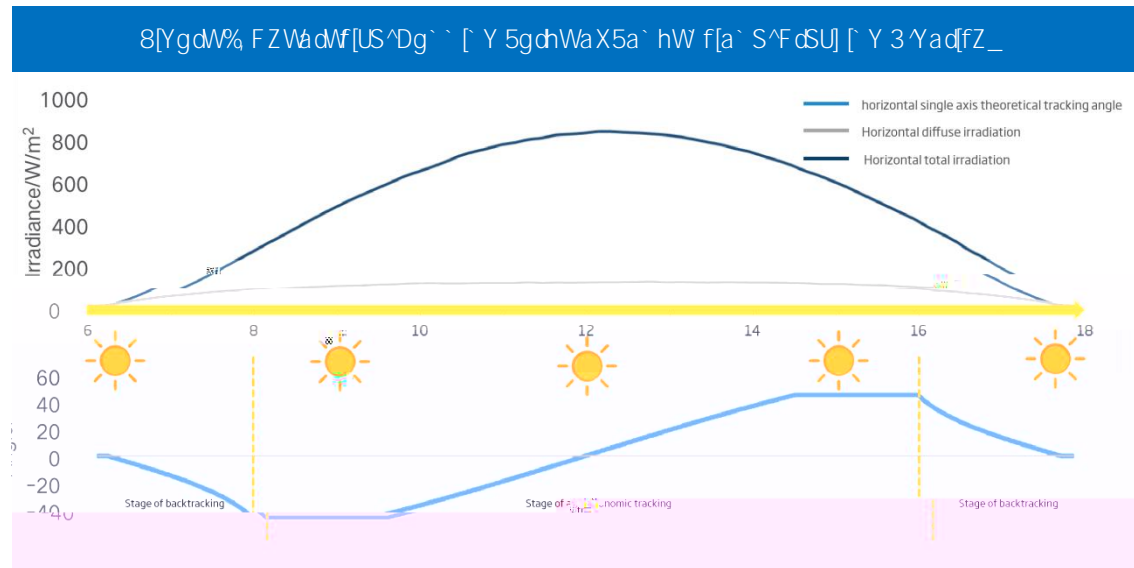
FZWea` Sd S`f[f]gVW[e `ai Vd [ fZWWSdk \_ ad [ Y S` V `SfWSXfVd aa` t ea fZSf fZW  
f dSU] [ Y S` Y`WUS`Ug`SfWV SUUadV[ Y fa Sefcb` a\_ [US^S`Yad[fZ\_ [e `SdYVd [ i Z[UZ USeW  
eZSVai e SdWXag` V TWfi VW SddSkef `MSV[ Y fa bai VdYW VdSf[a` `aeeZfZWdVadV fZW  
TSU] f dSU] [ Y S`Yad[fZ\_ eZS^TWSVabfW [ fZWWSdk \_ ad [ Y S` V `SfWSXfVd aa` fZSf [ef  
fZWf dSU] [ Y S` Y`WYdSVgS`k [ UdVSeWd! VWUdVSeWd Se fZWeg` d[eVd! eWf e i Z[UZ [e [ fZW  
abbae[fW V[dWUf[a` aX ea` Sd \_ af[a` t ea [f [e ]` ai ` Se TSU] f dSU] [ Y ž FZW S` Y`W aX  
TSU] f dSU] [ Y US` TWaTfS[ VW SUUadV[ Y fa fZW[ U[VW f ea` SddSkef SddSk b[fUZ S` V SddSk



Diagram illustrating the geometry of solar tracking. It shows a sun at an angle  $\alpha$  above the horizon, with a distance  $d_1$  between the sun and a tracking system. The system consists of a fixed base and a movable panel that can rotate to follow the sun's path.



Diagram illustrating the geometry of solar tracking. It shows a sun at an angle  $\alpha$  above the horizon, with a distance  $d_1$  between the sun and a tracking system. The system consists of a fixed base and a movable panel that can rotate to follow the sun's path.

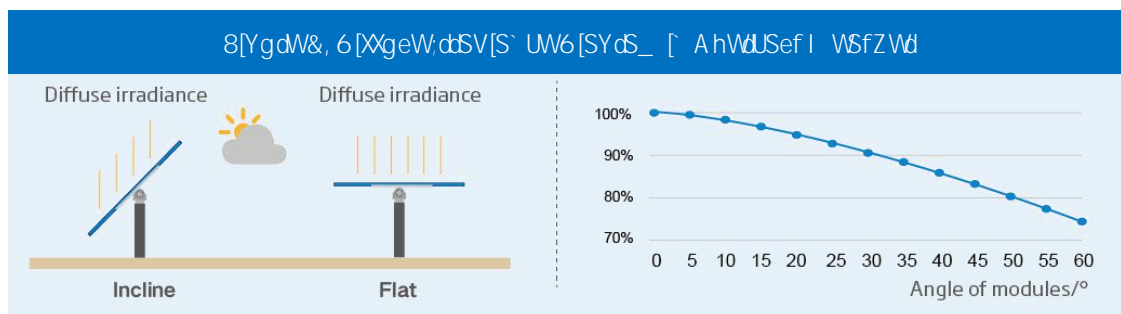


## 2.2 Deficiencies of conventional tracking algorithm

Diagram illustrating the geometry of solar tracking. It shows a sun at an angle  $\alpha$  above the horizon, with a distance  $d_1$  between the sun and a tracking system. The system consists of a fixed base and a movable panel that can rotate to follow the sun's path.

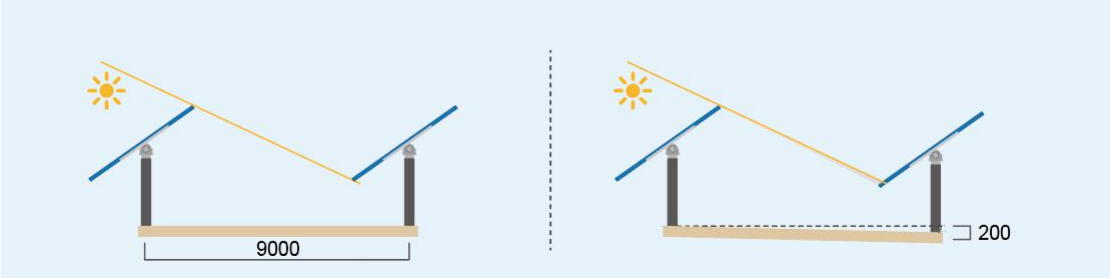
V[XXgeW[cdSV[S` UW[e` af Xg`k gf[fi VWzFZWdWXdW fZWUa` hW f[a` S^fdSU] [ Y S^Yad[fZ\_ XS[e fa Y[hWxg`b`Sk fa fZWSVhS` fSYWaXfdSU] Wd[ bai WdYW WdSf[a` ž

I ZW [f Ua\_ We fa fZWefSfWaXdMS^i VsfZWd Z[YZ V[dWUf [cdSV[S` UWi VsfZWd/eg` ` k VSkfi U`agVk S` V Z[YZ`k V[XXgeW [cdSV[S` UWi VsfZWd/ahWdUSeF S` V dS[ k VSkefi\_ Sk UaZy [efl S` V fZWdWsdW\_ adWahWdUSeF S` V dS[ k VSke [ ea\_ WsdMSel SUag` f[ Y Xad \_ adWfZS` ' " , aXfZWi Za`WkVsdz 3UadV[ Y fa e]k V[XXgeW[cdSV[S` UW\_ aVW[ [ fZW Z[YZ`k V[XXgeW [cdSV[S` UW i VsfZWd Se fZW \_ aVg`W S` Y`W [ UdMSel fZW V[XXgeW [cdSV[S` UWUSbfgdW Tk fZWXd` f e[VWaXfZW\_ aVg`WYdSVgS`k VWUdMSel fZWV[XXgeW [cdSV[S` UWUSbfgdW Tk fZW\_ aVg`Wsf Se\_ S^S` Y`W[e YdMSfWdfZS` fZWfdSU] [ Y S` Y`WaX Sefda` a\_ [US^S^Yad[fZ\_ /Se eZai ` [ fZWXYgdWfi S` V fZW`sdYd fZW\_ aVg`WS` Y`W[et fZWT[YWd fZWV[XXdW UW[ež 8adWj S\_ b`W i ZW fZWfdSU] [ Y S` Y`Wsf fZWefSYWaX Sefda` a\_ [US^fdSU] [ Y [e & ' »† fZW[cdSV[S` UW`aee\_ Sk dMSUZ gb fa #' , Ua\_ bSdW i [fZ TW[ Y ] Wbf X`Sfz/8[YgdW&fi



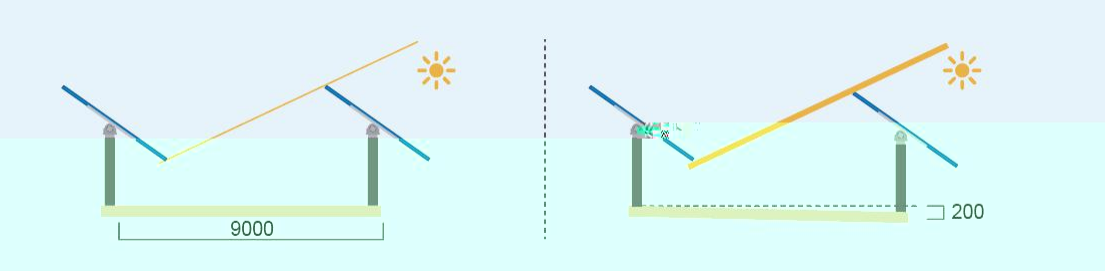
3f fZWeS\_ Wf\_ W [ SUfgS^bda WUfel fZWbda WUf e[fW[e` af Ua\_ b`WfWk X`Sf fWdS[ ž 3`eat Se g` WhW fWdS[ bda WUfe [ UdMSel kVsd Tk kVsd fZWdW [e S dMSf[hW S`f[fgVW V[XXdW UW TWfi WW SdSke VgW fa dgYYW fWdS[ S` V [ efS^Sf[a` Wdcdz ;X fZW TSU] fdSU] [ Y S` Y`WaX X`Sf fWdS[ [e SVabfW† eZSV[ Y aUgd TWfi WW SdSke† MSV[ Y fa bai WdYW WdSf[a` `aeež 8adWj S\_ b`W [XfZWSdSk b[fUZ [e +\_ † fZWdW[e S \$" U\_ S`f[fgVW V[XXdW UW TWfi WW SdSke† eZSV[ Ye aX SdSke i [^ aUgd Sf fZW efSYW aX 4SU] fdSU] [ Y† i Z[UZ USeWfZW† efS` fS` WageYW WdSfW bai Wd`aee\_ Sk dMSUZ &" , [ fZWZ[YZ V[dWUf [cdSV[S` UWi VsfZWdž 8[YgdW fi

8) YgdW( , EUZW\_ Sf[U6[SYdS\_ aXEZSVai e 5SgeW Tk 3 f[fgVW6 [XWdW UWTWfi WW 3dSke



3f fZWeS\_ Wf[ W VgWfa V[XWdW f fVdS[ e TWfi WW SdSke[ XeZSVW[e USgeW [ fZW\_ ad [ Yf [YZf W6] SYW\_ Sk TWXag` V Sf fZWefSYWaXTSU] f6SU] [ Y [ fZWSXfWd aa` f fZWdWtk W6V[ Y fa [ SVWtGsfWgf[¶l Sf[a` aXdWagdW6z/8) YgdW( fi

8) YgdW( , EUZW\_ Sf[U6[SYdS\_ aX>[YZf >W6] SYW5SgeW Tk 3 f[fgVW6 [XWdW UWTWfi WW 3dSke

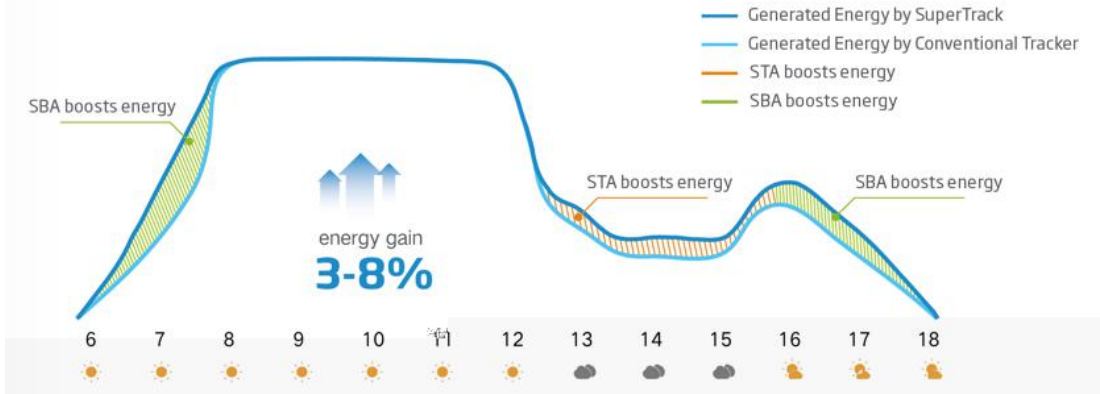




# 3 Definition and Main Value Points of SuperTrack

FZW Ua` hW f[a` S^ f dSU] [ Y S`Yad[fZ\_ V[V ` af Xg^k ef[\_ g`SfW fZW bafW f[S^ aX  
 Zad[l a` fS^e[ Y`WSj [e f dSU] Wd bai Wd YW WdSf[a` t ea Fd[ SF dSU] Wd ad[Y[ S`k VWhWabW  
 fZWe\_ Sd f dSU] [ Y fWUZ` a`aYkZEgbWdF dSU] t [ U`gV[ Y e\_ Sd f S`Yad[fZ\_ t \_ g`fZeagdUW  
 VSfS S` V eaXfi SdWb`SfXad\_ ž 4SeW a` fZWabf[\_ S^bai Wd YW WdSf[a` bWdXad\_ S` UWaX  
 fZW\_ aVg`W [f US` US`Ug`SfWfZWabf[\_ S^bai Wd YW WdSf[a` S` Y`WaXfZWT[XSU[S^\_ aVg`W  
 [ dMS^f[\_ WxadV[XWdW fi WdSfWd efSfWd S` V [VW f[Xk fZWUZ SdSUWd ef[Ue aXfZWdgYYW  
 fWdS[ [ S` [ fW`fYW fi Sk t [ VWbW VW f`k abf[\_ [l WfZWS` Y`WaX4SU] f dSU] [ Y [ WdSUZ  
 dai t Sha[V addWgUWTW[ Y eZSVW Tk Xda` f S` V dMSdeZSVai ef S` V Xg^k V[Y fZWbai Wd  
 YW WdSf[a` bafW f[S^ aX f dSU] Wd 5a\_ bSdW i [fZ Ua` hW f[a` S^ f dSU] [ Y S`Yad[fZ\_ t fZW  
 bai Wd YW WdSf[a` YS[ [e SeZ[YZ Se%Z\* , ž/8(YgdM) fi

8(YgdM) , EUZW\_ Sf[U6[SYdS\_ aX9S[ 7XWUf aXEgbWdF dSU] 3`Yad[fZ\_



High energy yield

- Compared with conventional tracking algorithms, SuperTrack can increase energy generation by up to 3-8%;



High adaptability

- Meeting the diversified needs of customers;
- Adapting to complex terrains and various weather conditions;



High intelligence

- Self-perception, self-learning, self-decision making;
- Proprietary technology for the power generation model;



High stability

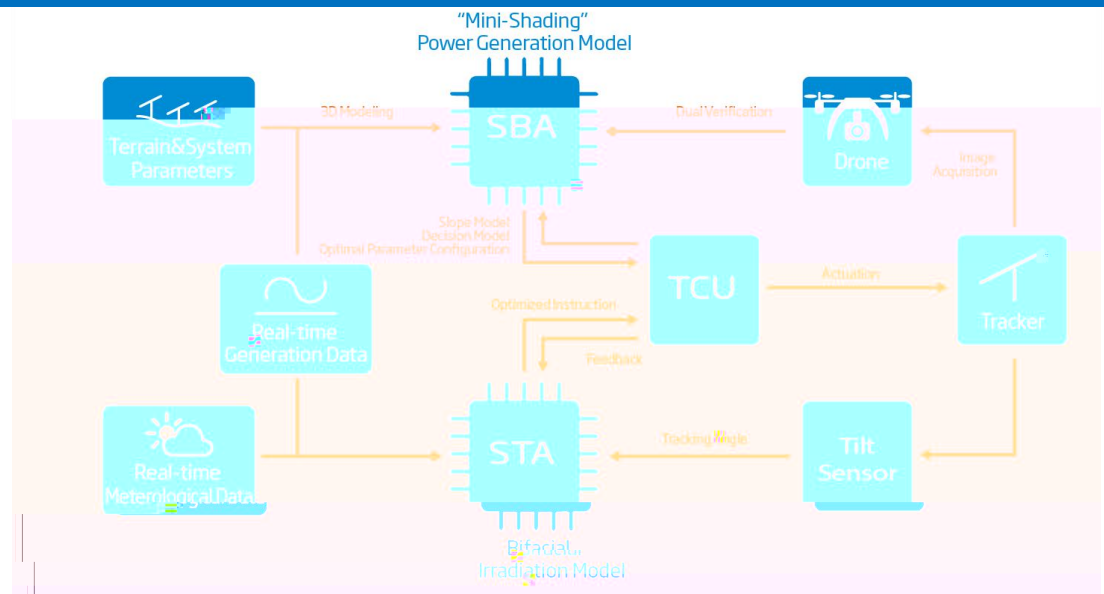
- Long-term test data analysis;
- Reducing the rotation of the tracker

# 4 Introduction of SuperTrack Algorithm

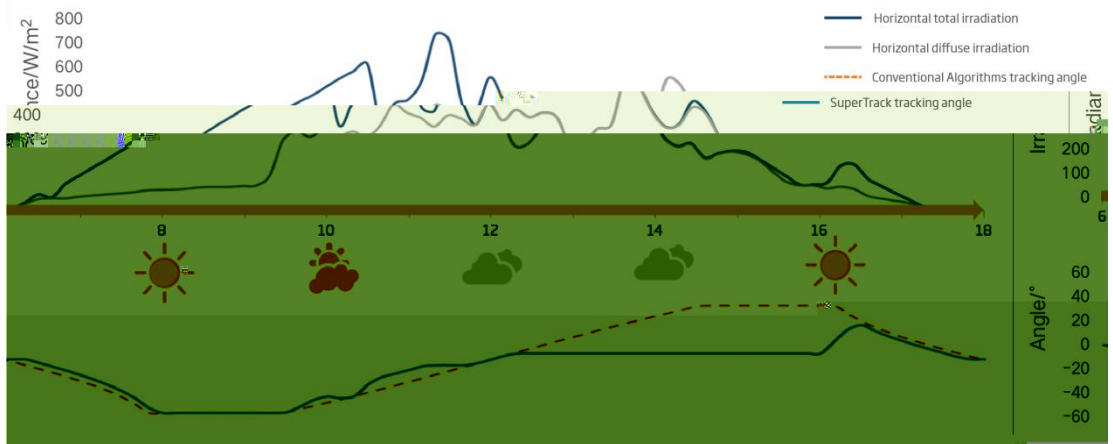
SuperTrack comprises two key algorithms:

- 1 | Smart Tracking Algorithm (STA) is used to solve the irradiance problem.
- 2 | Smart Backtracking Algorithm (SBA) is used to solve the shading problem brought by the next terrain.

8[YgdW\*, 4`aU] 6[SYdS\_ aXEgbWf dSU] E\_ Sdf 5a` fda^>aY[U

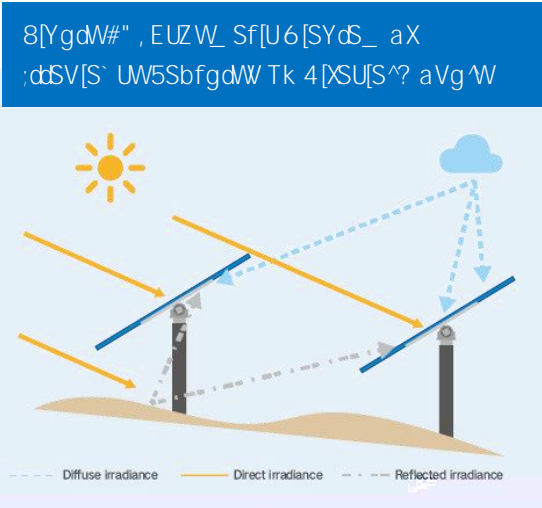


8[YgdW+, 5a` f dSef 6[SYdS\_ aXF dSU] [ Y 3` Y We TWfi WW EgbWf dSU] S` V 5a` hW f[a` S^ 3 YadfZ\_e



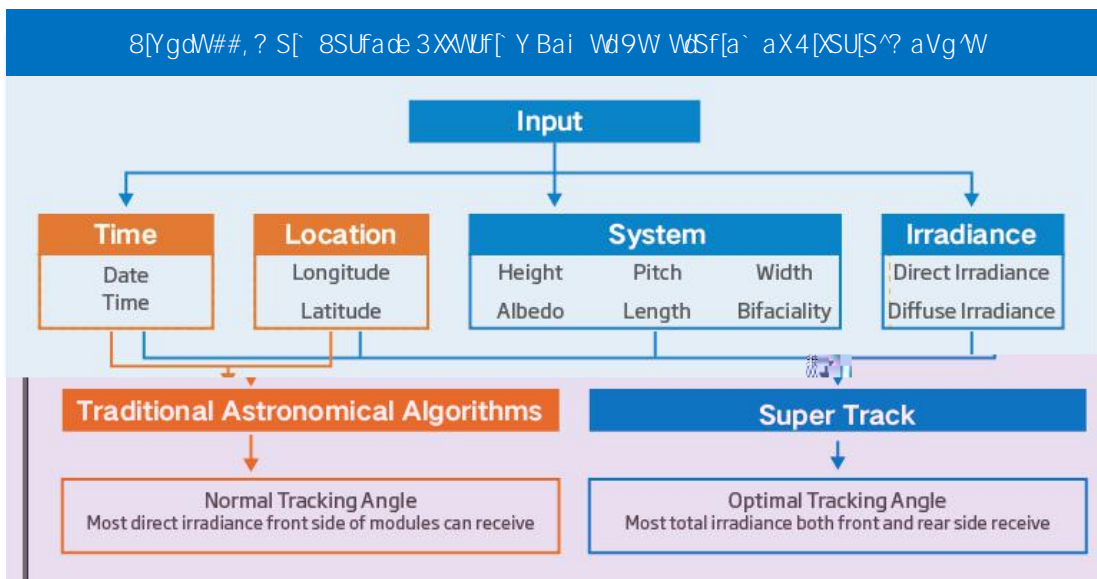
# 4.1 Tracking angle optimization STA for high diffuse irradiance weather

## 4.1.1 BIM



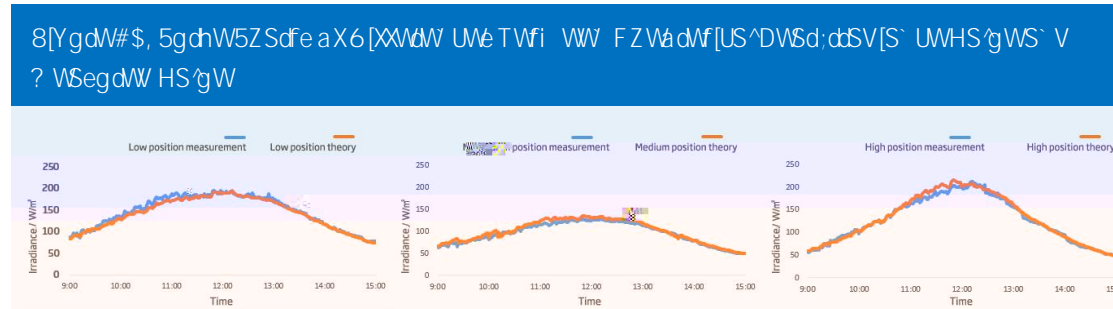
3e fZWbdabadf[a` aXT[XSU[S^\_ aVg`W  
Sbb^fUSf[a` e [ UdVSeVe kVsdTk kVsd [f ZSe  
TWW S fdW V fZSf \_a` aXSU[S^\_ aVg`W [Zad][a` fS^e[ Y`WSj [e fdSU]Wd ekefW\_ i [^  
TW dM^SUNW Tk T[XSU[S^\_ aVg`WZ FZW  
Ua` hW f[a` S^ Sefda` a\_ [US^ fdSU] [ Y  
SYad[fZ\_ a` k Ua` e[VWde \_ Sj [ \_g\_ Xda` f  
[dSV[S` UW i Z[WT[XSU[S^\_ aVg`W` WWe fa

fS] W[ fa SUUag` f \_ Sj [ \_g\_ Xda` f S` V dVsd [dSV[S` UW FZWdWadW fZWdW[e S UWdFS]  
V[XXdW UW[ fZWfdSU] [ Y S` Y`We aXT[XSU[S^S` V \_a` aXSU[S^\_ aVg`We g` VVd[VXXdW f  
Ua` V[f[a` ezFZW4;? ad[Y[ S`k VWhWabW Tk Fd[ S fS] We [ fa Xg`^SUUag` f # \$ ] Wk XSUfadet  
US`Ug`SfVe Xda` f V[dWUF [dSV[S` UW V[XXgeW [dSV[S` UW dVXWUFW [dSV[S` UW S` V dVsd  
dVXWUFW [dSV[S` UW S` V V[XXgeW [dSV[S` UW S` V X[ S`k YWfe fZWfafS^ [dSV[S` UW aX  
T[XSU[S^\_ aVg`WZ

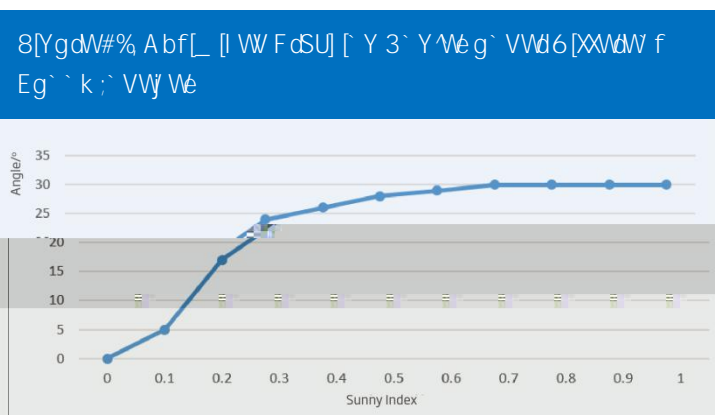


3e eZai ` [ fZW[XYgdW fZWSUUGdSUK hWd[XUSf[a` Wj bWd[ W f Xad fZW[dSV[S` UW  
\_ aVWi Se USd[W agf Sf fZW5ZS` YI Zag FWeF 5W fVdSf V[XXdW f f[ Wba[ fet V[XXdW f

egdXSUWS'TWaf i VsfZWdefSfVé S` V bae[f[a` ežFZW`a` YžfVd\_ Vj bVd\_ W f dVeg`fe eZai  
 fZSf\_ VSegdW hS'gVé SdMTSe[US^k Ua` e[efW f i [fZ fZWbdW[UfW hS'gVé aXfZW\_ aVW`  
 S` V fZWahVéS^Wbd[e i [fZ[ ` . † ea fZSf fZW\_ aVW`[e SUUgdSfWS` V dV[ST`Vž/8[YgdW  
 #f\$fi



### 4.1.2 Tracking angle optimization for high diffuse weather

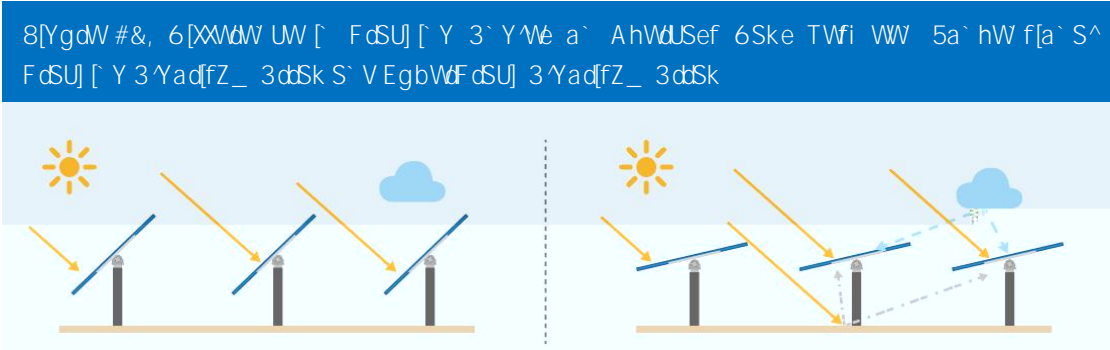


4SeW a` fZW 4;? † fZW  
 fdSU [ Y S` Y`Vé SdWV[XXWdW f  
 g` VVd V[XXWdW f i VsfZWd  
 efSfVéž EbWU[X[US^kt eg` ` k  
 [ VVj /" Ž#fi [e VVX[ W  
 V[XXWdW f i VsfZWd efSfVéž  
 fZWZ[YZVdfZWeg` ` k [ VVj

[eł fZWeg` ` [Vd fZWVSk [eł fZWZ[YZVdfZWbdabdf[a` aXV[dWUf [dSV[S` UW[eł S` V fZW  
 `ai Vd fZWbdabdf[a` aXV[XXgeW[dSV[S` UW[ež A` fZWUa` fdSkł fZW`ai Vd fZWeg` ` k  
 [ VVj [eł fZWZ[YZVdfZWbdabdf[a` aXV[XXgeW[dSV[S` UW` S` V fZW`ai Vd fZWbdabdf[a`  
 aXV[dWUf [dSV[S` UW` 8ad Vj S\_ b`W i ZW US`Ug`Sf[ Y fZW abf[ S^fdSU [ Y S` Y`W aX  
 T[XSU[S^\_ aVg`Wg` VVd V[XXWdW f eg` ` k [ VVj Vé Sf S UWdFS[ f\_ Wba[ f Vgd[ Y fZW  
 Sgfg\_ [ 5ZS` YI Zagł SeeZai ` [ fZW[XYgdW#%đ fZWsefda` a\_ [US^fdSU [ Y S` Y`W[e%" »ž  
 :XfZWeg` ` k [ VVj [e Z[YZVdfZWsefda` a\_ [US^S` Y`WeZS^TWgeWž:XfZWeg` ` k [ VVj [e  
 `ai Vd egUZ Se" žł fZW\_ Sj [ \_g\_ fdSU [ Y S` Y`W aXfafS^[dSV[S` UW[e #) »ž:XfZWeg` ` k  
 [ VVj [e Vj fdW\_ Wk `ai † [VždS[ k VSkel fZWfZWdW[UfW[US^fdSU [ Y S` Y`W[e" »ł S` V fZWfafS^  
 [dSV[S` UWdVdSUZVé fZW\_ Sj [ \_g\_ ž

EgbWdF dSU] e\_ Sdf fdSU] [ Y S'Yad[fZ\_ dV[Ve a` fZWbdabq[VfSck fWUZ` a`aYk aX4;?  
 fa VWWb`k `MSd` fZW bai Wd YW WdSf[a` UZScSUfWd[ef[Ue g` VVd fZW \_g`f[ZbScS\_ WfWd  
 [ \_bSuf aXT[XSU[S^\_ aVg`WV k` S\_ [US`k eWV] e fZWabf[\_ S^fdSU] [ Y S` Y`W[` dMS^f[\_ WS` V  
 [ \_bdahWe bai Wd YW WdSf[a` [ Z[YZ`k V[XXgeW [dSV[S` UW i WsfZWd SUUadV[ Y fa  
 \_ WfWada`aY[US^S` V ekefW\_ abWdSf[a` VSfSž

Fd[ SEa`SdZSe TWW VWWb`k W YSYW [ fZW[XW aXbZafaha fS[Ubai WdYW WdSf[a`  
 Xad\_ S` k kVScž3e eZai ` [ fZW[XYgdW#&† fZdagYZ fZWdWVScUZ a` `a` YžfWd\_ bai Wd  
 YW WdSf[a` bWdXad\_ S` UW aX bZafaha fS[U \_aVg`Wd Fd[ S` ZSe SUUg\_ g`SfW d[UZ  
 Vj bWd[W UW WefST [eZW bai WdYW WdSf[a` \_aVW`Xad\_ g`f[ZV\_ W e[a` S^S` S`ke[e] S` V  
 Xgd fZWdabf[\_ [ W fZWfdSU] [ Y S` Y`W egUZ Se b`SU[ Y Sf S e\_ S^S` Y`Wa` ahWdUSe f VSke[e  
 ea Se fa W egdWfZWabf[\_ S^a` YžfWd\_ bai WdYW WdSf[a` aXfZW\_ aVg`Wdž

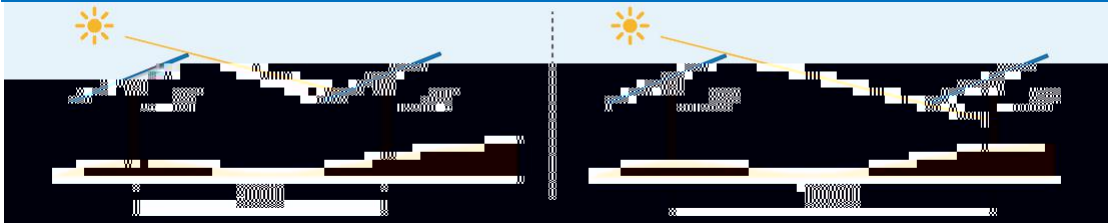


3f fZW eS\_ Wf\_ W [ Z[YZ`k V[XXgeW i WsfZWd EF3 US` aTh[agek dWgUW fZW  
 dafSf[a` Uag` f S` V S` Y`WaX fZWefdgUfgdWd S` V Vj fW V fZWgeWg`^XWax\_ afade S` V  
 efdgUfgdWdž FZWZ[YZ V[XXgeWsdWSe] egUZ Se 5ZS` YI Zag† ZShWfkb[US^ahWdUSe f VSkež3e  
 eZai ` [ fZWfST`W#† Ua\_ bSdW i [fZ Ua` hW f[a` S^fdSU] [ Y S'Yad[fZ\_ † EgbWdF dSU] US`  
 dWgUW fZW dafSf[a` S` Y`W S` V Uag` f Tk \* " . † [ i Z[UZ USeW fZW S` `gS^ ShWdSYW  
 dafSf[a` S` Y`WUS` TWdWgUW Tk STagf #) . † S` V fZW dafSf[a` Uag` f US` TWdWgUW Tk  
 STagf \$\* . ž

FST`W#, 5a`_ bSd[ea` TWfi WW 5a` hW f[a` S^3`Yad[fZ_ S` V EgbWdF dSU] [ DafSf[a` 3` Y`WS` V 5ag` f a` Fkb[US^AhWdUSe f 6Ske				
5a` hW f[a` S^fFSU] [ Y 3`Yad[fZ_		EgbWdF dSU]		
DafSf[a` 3` Y`W	\$" " »	DafSf[a` 3` Y`W	&" »	ž* " .
DafSf[a` 5ag` f	\$" "	DafSf[a` 5ag` f	&"	ž* " .

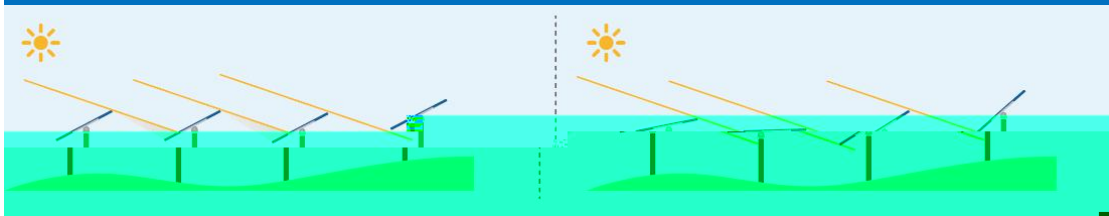
## 4.2 SBA, backtracking angle optimization for complex terrain

8[YgdW#', 3ha[V dai ŽfaŽdai eZSV[ Y Tk 7' ^SdY[ Y 3dSk B[fUZ



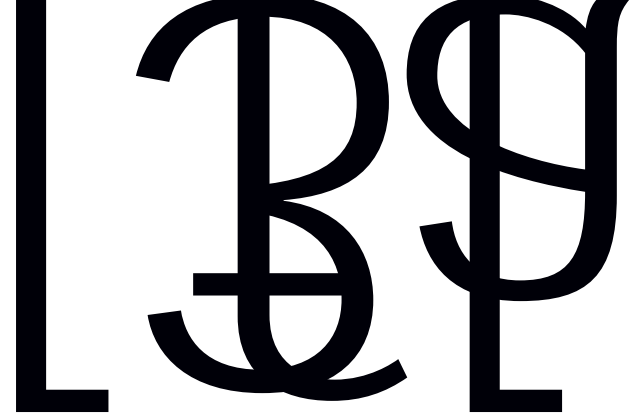
3e eZai ` [ 8[YgdW #' t [f [e baee[T W fa Ua\_ bW eSfW Xad fZW VWX[U[W Uk aX  
 Ua` hW f[a` S^TSU] fdSU] [ Y SYad[fZ\_ e Tk [ UdMSe[ Y fZW SdSk ebSU[ Y fZW adWf[US^k t  
 Tgf [ SUfgS^bda WUfel fZWSdSk ebSU[ Y dW\_ S[ e TSe[US^k fZWeS\_ W i Z[WfZWZWYZf  
 V[XWdW UW TWfi VW SdSke hSdVef S` V SXFVd Sbbcbq[SfWk [ UdMSe[ Y fZW ebSU[ Y t  
 ea\_ WaXfZWSdSke i [^ef[^TW eZSVW t i Z[W ea\_ WSdSke ZShW^YZf W S] SYW? adVahWd  
 Xda\_ fZW bWdebWUf[hWaX` S` V Uaefl fZWea`gf[a` aXSV`gef[ Y fZW TSU] fdSU] [ Y S` Y`WaX  
 W SUZ dai [e aXZ[YZWdSbb^UST[ f k z

8[YgdW#(, 6[SYd\_ aXE43 aXEgbWf dSU]



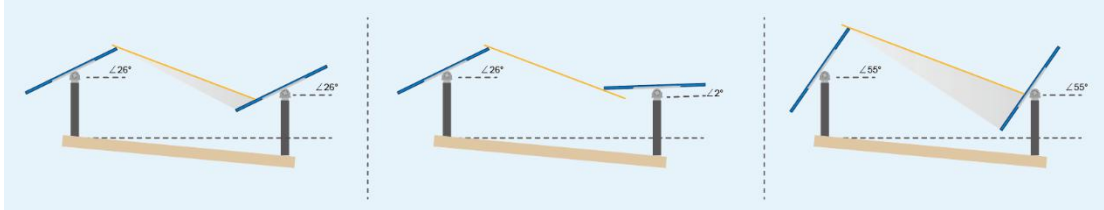
3e eZai ` [ fZW 8[YgdW#( EgbWf dSU] e\_ Sd TSU] fdSU] [ Y SYad[fZ\_ SVabfe  
 ekefW\_ abWsf[a` VSfS fa bW Xad\_ VefgdTS` UWfdS[ [ Y S` V /adfi SVabfe G3H eW e[ Y  
 fWUZ` a`aYk fa [VW f[Xk eZSV[ Y S` V Ua` efdgUf fZdWZV\_ W e[a` S^fWdS[ ž 4SeW a`  
 \_ SUZ[ W Wsd [ Y SYad[fZ\_ S` V ? [ ZEZSV[ Y ? aVW t [f agfbgfe fZW abf\_ S^  
 TSU] fdSU] [ Y S` Y`W Ydgb Xad ahWdS^ bai Wd YW Wsf[a` fZdagYZ [fWsf[hW  
 VWU[e[a` Ž\_ S] [ Y S` V WXXUf[hWk W ZS` Ue fZW bai Wd YW Wsf[a` Sf fZW efSYW aX  
 TSU] fdSU] [ Y S` V Ua` eWcgW f k SUZ[hWVe fZW [VW f[XUSf[a` S` V abf\_ [I Sf[a` aX  
 Ua\_ b`Wj fWdS[ S` V Y[hVe Xg^b`Sk fa fZW bai Wd YW Wsf[a` SVhS` fSYWaXfdSU] W z





4SeW a` Fd[ SEa`Sde `a` YZfWd\_ efgVk a` fZWbai WdYW WdSf[a` UZScSUFVd[ef[Ue aX  
 BH \_aVgW i [fZ!i [fZagf eZSV[ Yt eWLa` VScK abfL [I Sf[a` [e bWdAd\_WW a` fZW  
 fZWadW[US^TSU]fdSU] [ Y S` Y`W egUZ Se S` S`ki [ Y fZW\_L bSUF aX [VdSfUzTWi`WW  
 SdbSke fa YWf fZWTSU]fdSU] [ Y abfL [I Sf[a` S` Y`WYdagbž 3e eZai ` [ fZWX(YgdW#) †  
 fZWdW [e S` S`f[fgVW V[XWdW UW TWfi WW SdbSaz];X fZVk ef[<sup>m</sup> dafSfW Sf fZW X`Sf  
 TSU]fdSU] [ Y S` Y`WaX \$" »† bai WdYW WdSf[a` `ae VgWfa eZSV[ Ye i [<sup>m</sup>atUgd [██████████]  
 eWLa` V S` V XagdfZ dai ež EgbWdFdSU] US` WXXWf[hWk [VW f[Xk fWdS[ [ Xad\_Sf[a`  
 fZdagYZ G3HeZSe[VWdWUZ` a`aYk S` V/adfioX a

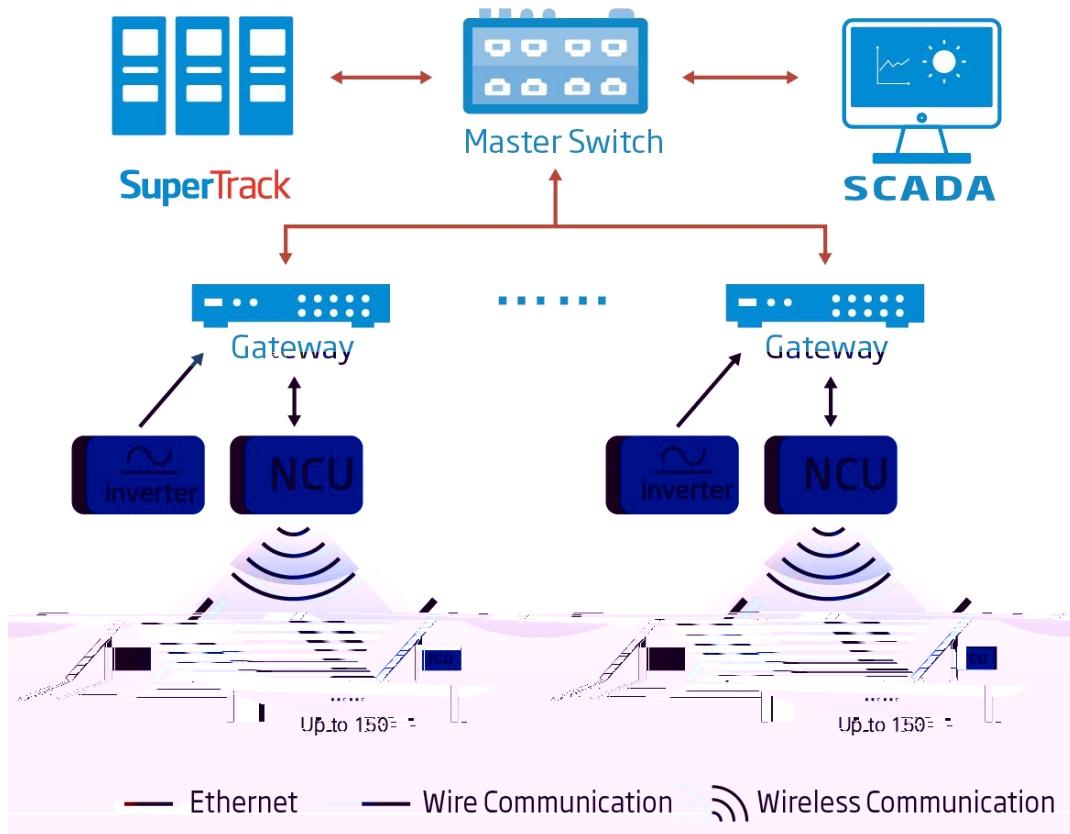
8[YgdW#\*, 5a\_ bSdfea` TWfi WW fZWEUZW\_ WfZSf DWgUMé fZW3` Y`WG` f[^@af EZSVW  
 S` V fZWEUZW\_ WfZSf;` UdMSeWé fZW3` Y`WG` f[^: S`XEZSVW



3e eZai ` [ fZWXYgdW#\*† [ h[W aXfZWbdaT`W\_ fZSf fdSU] [ Y SddSk [e eZSVW†  
 YW WdS^abf[\_ [l Sf[a` S`Yad[fZ\_ i [^dWgUWfZWfdSU] [ Y S` Y`WG` f[^fZW\_ aVg`W[e` af  
 eZSVWž: ai WhWd [ USeWaXYdMsfWd fWdS [ V[XWdW UW fZW\_ WfZaV` WWe fa dWgUW  
 Wj UMé[hWS` Y`Wad[f [e ef[^eZSVW WhW [f [e] Wb f X`Sf i Z[UZ \_ WS` e fZSf fZW[ddSV[S` UW  
 USbfgdW Tk fZW\_ aVg`WdWgUMé S` V ;3? `áee [e YdMsfž fZWdWadW [f \_ [YZf TWS TWfWd  
 abf[\_ [l Sf[a` \_ WfZaV fa dWgUWfZWS` Y`WG` f[^bSd[S`k eZSVW ad [ UdMSeWS UWdS [ S`  
 Y`WUa\_ bSdW i [fZ dWgU] Y S` Y`Wž 3e S dMég`f† [f [e fZW\_ aef dMSea` ST`Wfa W egdW  
 fZWabf[\_ S^ahWdS^bai Wd YW WdSf[a` Tk Ua\_ bSd [ Y fZWagfbgf dMég`fe aX V[XWdW f  
 abf[\_ [l Sf[a` \_ WfZaVež

# 5 SuperTrack System Architecture

8[YgdW#+, EgbWdF dSU] EkefW\_ 3dJZ [fWUfgdW



Fd S e\_ Sdf f dSU [ Y ekefW\_ Ua` e[efe f dSU] Wd efdgUfgdWd f dSU] Wd Ua` fda^g` [f /F5Gfi` Wfi ad] Ua` fda^g` [f/@5Gfi EgbWdF dSU] b`SfXad\_ S` V E5363Z3`ea [f US` XWY [T`k \_ SfUZ i [fZ [ hWdF dS` V afZWd Wcgb\_ W fi fZWdWtk Tg[V` Y [ fWdSfW ea`gf[a` e fa bZafaha fS[Uf dSU] [ Y ekefW\_ z/8[YgdW#+f`F ST`W\$fi

FST`W\$, #` " ` ? | BH E fSf[a` 5a` X[YgdSf[a` FST`W

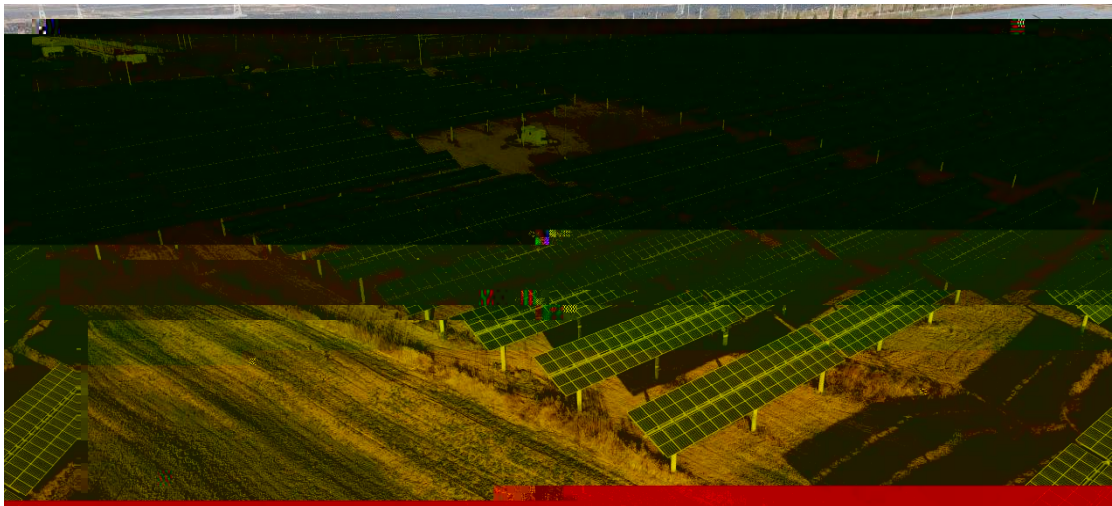
	F dSU] [ Y	F 5G	@5G	EaXfi SdWB`SfXad_	EW ead
EgbWdF dSU]	#` " " eWfe	#` " "	#` " p\$"	#eWf	#eWf
5a` hW f[a` S^ F dSU] [ Y EkefW_	#` " " eWfe	#` " "	#` " p\$"	!	!

(Note: Sensing equipment shall be flexibly increased according to project zoning.)

# 6 Test Data and Gain Simulation

## 6.1 Test data

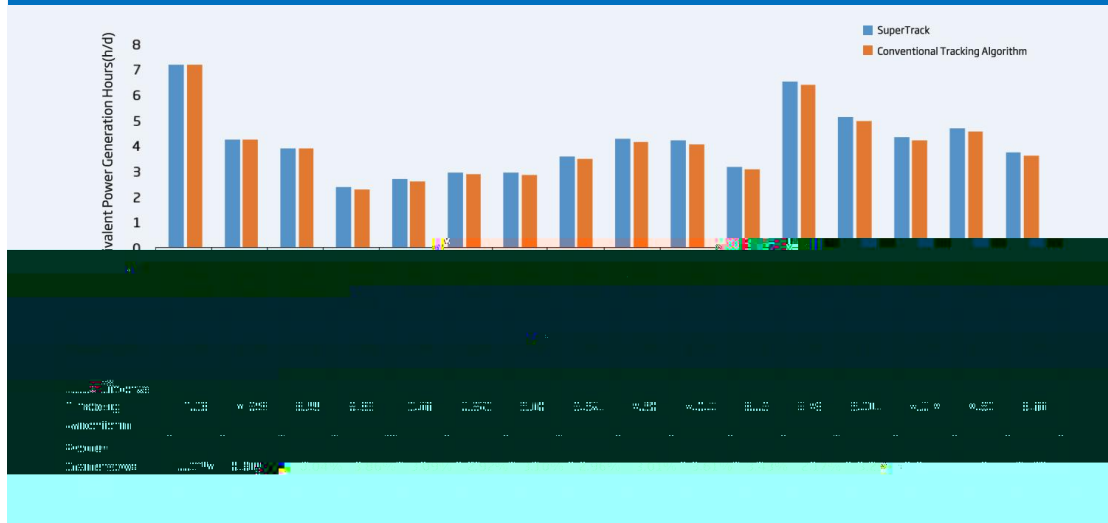
### 6.1.1 30MW mountain project in Tongchuan



FZWbai WdefSf[a` [e `aUSfW [ K[g` 5ag` fkl Fa` YUZgS` 5[fkl EZSS` j [ Bdah` UW  
 5Z[ Sz`f SVabfe T[XSU[S^\_ aVg^WŁ Zadl a` fS^e[ Y^WSj [e fdSU] Wd ekefW\_ S` V eWUfe  
 \_ WSi SffZ^WhW^ bZafaha^fS[U SdSke i [fZ e\_ [^Sd fWdS[ Xad hWd[XUSf[a` ž EbWU[XU  
 bdaWUf [ Xad\_ Sf[a` [eeZai ` [ fZWfST^W%

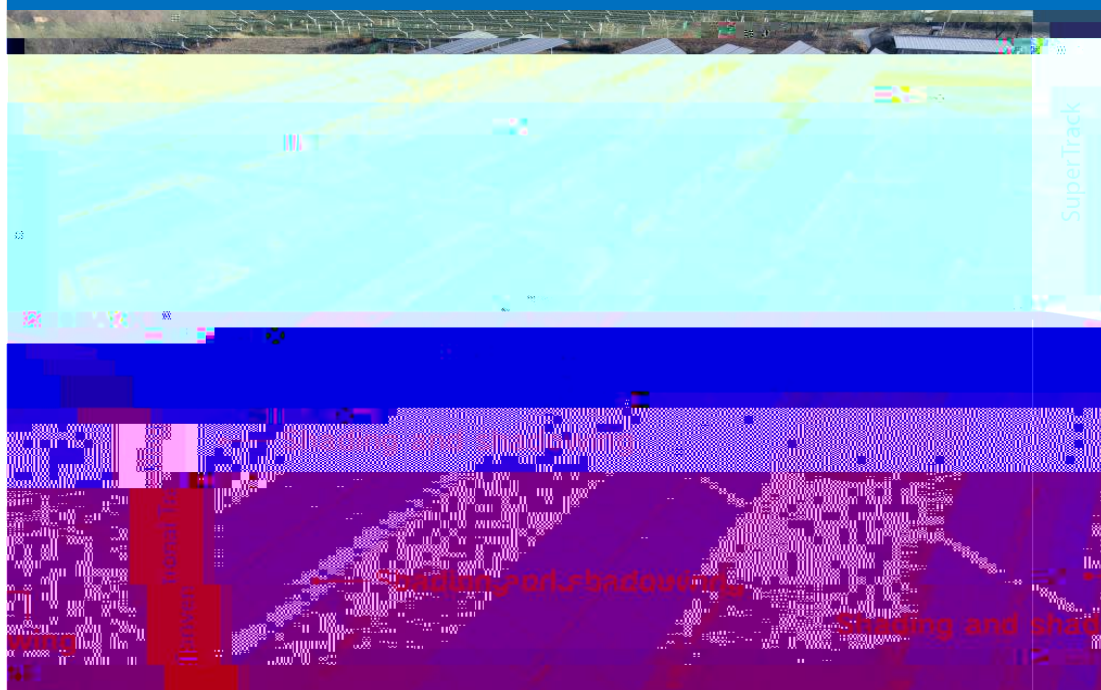
FST^W% >[ef aX5a` V[f[a` eXad%` ? I ? ag` fS[ BdaWUf [ Fa` YUZgS`			
BdaWUfe[fW	Fa` YUZgS` ł EZSS` j [	FWef f_ W	? Sk \$" \$" ŽEWbfW_ TWd\$" \$#
>a` Y[fgVW S` V `Sf[fgVW	% ž&»@ #" +ž#) »7	FWdS[	3hWdSYWe^abW[e STagf %
AbWdSf[ Y fW_ bWdSfgdW	Ž\$#ž' p %+ž)	? aVg^W	FE? Ž@79( ? 5ž\$" /;fi %% I T[XSU[S^_ aVg^W
;dSV[S` UW	#%" " ]I Z!_ 3p #&" " ]I Z!_ 3/4	fdSU] Wde	HS` YgSdV \$B
Bdabaf[a` aX V[XgeW	' %	95D	" ž&#
EgdXUW Ua` V[f[a`	9cSee^S` V	: WYZf	%ž _

8[YgdW\$, 5a\_bSd[ea` aX7cg[hS`W f Bai Wd9W WdSf[a` : agdS` V Bai Wd9W WdSf[a`  
 9S[ [ 6[XWdW f? a` fze



3eZai` [ fZXW[YgdW\$` fZXWbai WdSf[a` i SeUa`` WUfW [ faYdV [ ? Sk\$` \$` f  
 S` V [fSVabfW Sefda` a` [US^SYad[fZ\_ XadS^SddSke Xda` ? Sk fa`gkz3eS` WSh`gSf[a`  
 TSe[e Xad V[XWdW UW TWfi WW SddSke fZWUa\_bSd[ea` fWef i Se aXU[S`k efSdFW [   
 EWbfW\_TWd\$` \$` žFZWUa` hW f[a` S^fcdSU [ YSYad[fZ\_ [eef[^SVabfW Xadea` WSddSkež  
 4k Ua\_bSd` Y fZW [ fWdSfW EgbWdFcdSU] SYad[fZ\_ e XadSddSke fZWShWdSYWaXeZSVW  
 SddSke bcbad[f[a` [e STagf %` . žFZWfWef `SefW XadS kWsd S` V fZWdWeg`fe eZai` fZSf  
 bai WdYW WdSf[a` [ EgbWdFcdSU] SddSk i Se [ bcdhW Tk %ž' ( . f S` V fZWfWef VSfS i Se  
 hWd[XW Tk 595ž

8[YgdW\$, >[hWbZafa aX5a` hW f[a` S^fcdSU [ Y 3ddSk S` V EgbWdFcdSU] 3ddSk EZSV [ Y Sf  
 fZWEfSYWaX4SU] fcdSU [ Y

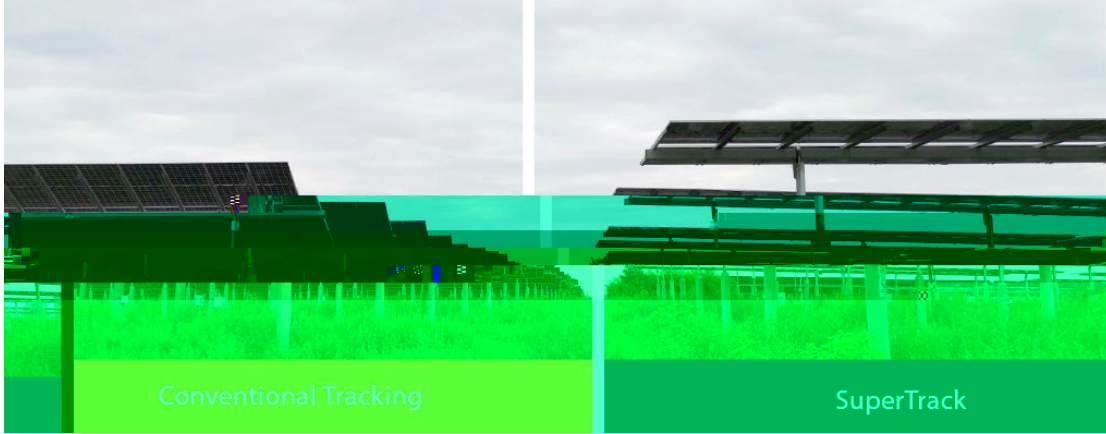


3e eZai ` [ fZWX(YgdW\$#i [hWbZafae aXfZWfWef bdaWUf [ Fa` YUZgS` a`  
eg` ` k VSke Sf fZWefSYWaXTSU] fdSU] [ Yf eZSVai eZSVWS` V (YZf ^MS] SYWUS` TWXag` V  
VgWfa fWdS[ V[XWdW UW[ Ua` hW f[a` S^fdSU] [ Y SddSkz FZWdWadW EgbWdF dSU] SddSk  
i [^abf[\_ [l WV[XWdW f TSU] fdSU] [ Y S` Y^Wd XadWSUZ dai aXSddSke SUUadV[ Y fa fWdS[  
Ua` V[f[a` et dWgUW (YZf ^MS] SYWSe \_gUZ Se baeet^Wi Z[WSha[V[ Y eZSV[ Yf S` V  
W ZS` UWbai WdYW WdSf[a` Sf fZWefSYWaXTSU] fdSU] [ Yz

EbWU[XUS^kt Se eZai ` [ fZWX(YgdW\$#i fZWdWScW' dai e aXfdSU] Wde [ fZW



8[YgdW\$% 5a\_ bSd(ea` aX3dSk 3` YMeTWfi VW EgbWdFdSU] 3Yad[fZ\_ S` V  
 5a` hW f[a` S^FdSU] [ Y 3Yad[fZ\_



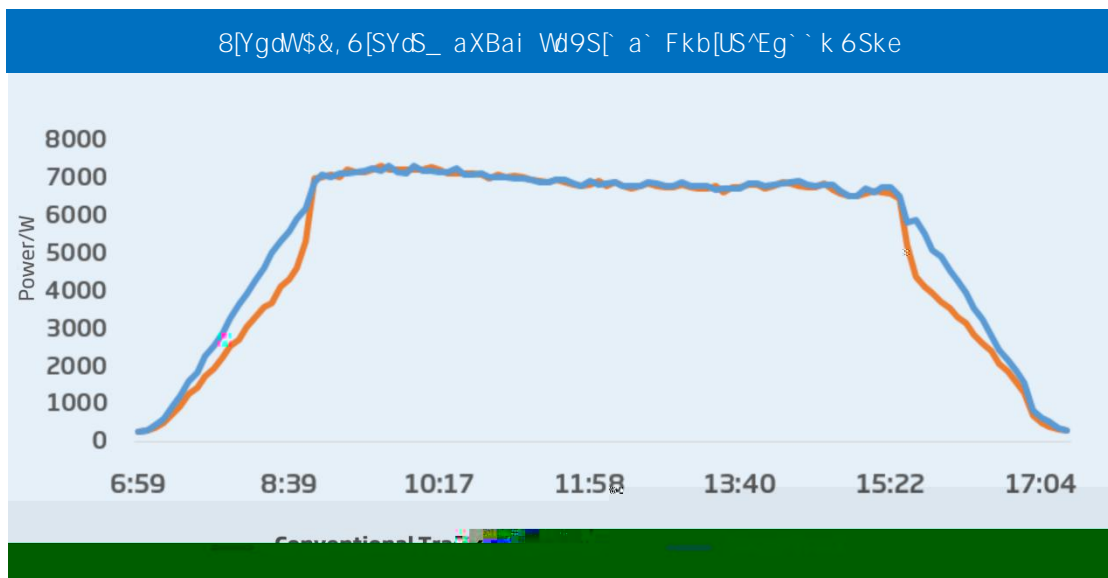
3e eZai ` [ fZWX(YgdW\$%d a` ahWdUSeF ad dS[ k VSket EgbWdFdSU] i [^b^SUWfZW  
 fdSU] WdSf S e\_ S^S` Y^Wad] WWb fZWfdSU] WdXSf SUUadV[ Y fa i VsfZWdUa` V[f[a` eZfZW  
 YdVsfWdFZW[XWdW UWTWfi VW fZWSdSk S` Y^WaXUa` hW f[a` S^fdSU] [ Y SYad[fZ\_ S` V  
 fZWabf[\_ [l VW SdSk S` Y^W fZWZ[YZWd fZWYS[` aX EgbWdFdSU] bai WdYW WdSf[a` žA`  
 fkb[US^ahWdUSeF S` V dS[ k VSket fZWWS[k bai WdYW WdSf[a` YS[ \_ Sk dVdUZ #S\$\* ( . ž

## 6.1.2 Test field in Changzhou

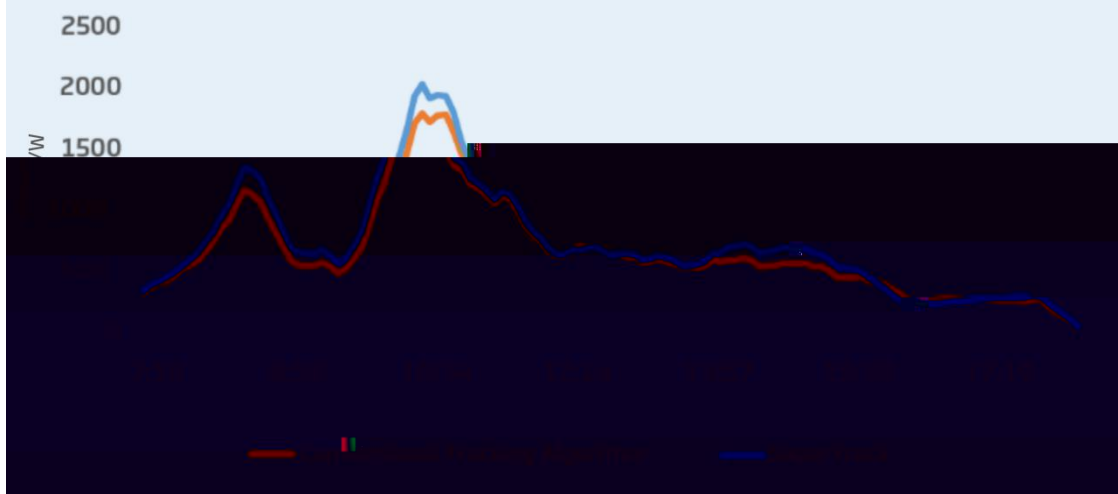


Fd S Ea Sd ZSe S'ea VW\_ a` efdSfW fZSf SdSke i [fZ fZW EgbWf dSU] [ fW YW f dSU] [ Y S Y ad fZ\_ ZShWe [Y` X[US` f'k [ UdMSeW fZW d bai Wd agfbgf [ 5ZS` YI Zag fWef UW fWz

3e eZai ` [ 8[YgdW\$& S` V 8[YgdW\$' t a` S fkb[US^eg` ` k VSkf fZWSdSk agfbgf bai Wd [e e\_ [Sd Vgd` Y fZW f dSU] [ Y efSYW i Z[ WVgd` Y Sf fZWefSYWaXTSU] f dSU] [ Y fZW agfbgf bai Wd aXfZWLa` hW f[a` S^S Y ad fZ\_ SdSk [e 'ai Wd VgWfa eZSV` YI i Z[W fZWEgbWf dSU] SdSk Sha [Ve eZSV` Yt dWeg` f` Y [ S` [ efS` fS` W age bai Wd [ UdMSeWaX

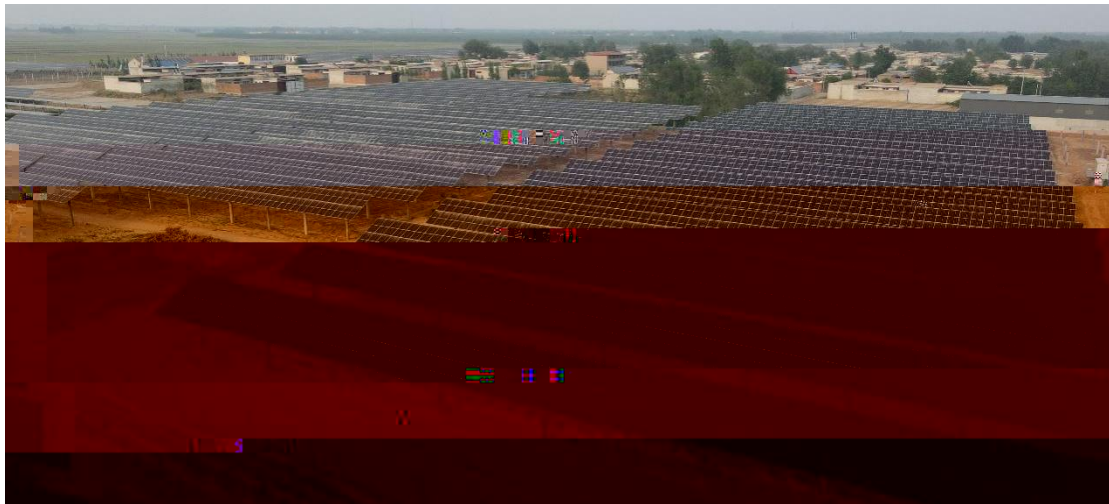


/@afWFZWYS[ Ua\_ bSd[ea` [e Xade` Y WZdai f dSU] Wdi Z[UZ SdWeZSVW [ TafZ fZW\_ ad [ Y S` V SXfWd aa` fi



gb fa % . S` V S bai WdYW WdSf[a` YS[ aXgb fa &ž &. ž;` fkb[US^ahWdUSeF Ua` V[f[a` et  
fZWUa` hW f[a` S^fdSU [ Y S^Yad[fZ\_ daFsfWè Sf S` S` Y^Wfa fZWeg` f dWèg`f[ Y [ S` ai Wd  
agfbgfi i Z[WfZWEgbWdFdSU SddSk daFsfWè fa S e\_ S^WdS` Y^W dWèg`f[ Y [ S` ahWdS^  
bai WdYS[ aX+ž&#. ž

### 6.1.2 Test field in Nangong



EgbWdFdSU ZSe TWW Sbb^TW fa &" " ? I bdaWUf ^aUSfW [ @S` Ya` Y15Z [ Sz FZW  
fdSU [ Y ekefW\_ i Se Ua` ` WUfW fa Yd[V [ g` W \$" \$#ž 4k fZW W V aX EWbfW\_ TWd  
FdSU [ Y ekefW\_ ZSV abWdSfW Xad )) VSke[ [ U'gV[ Y \$' VSke aX Z[YZ`k V[XgeW  
[ddSV[S` UW i WsfZWd S` V fZW ShWdSYW bai Wd YW WdSf[a` YS[ [ Z[YZ`k V[XgeW  
[ddSV[S` UW i WsfZWdi Se%ž &. f [ U'gV[ Y S fkb[US^U'agVk VSk i [fZ S bai WdYW WdSf[a`  
YS[ aX\*ž` % ž

## 6.2 Gain potential estimation and third-party verification

FZW \_ S[ XSUFade SXXWUF[ Y bai Wd YW WdSf[a` YS[ [ UgVW S'f[fgVW fWdS[ V[XXWdW UW/eZSV[ Y SdSk bcbad[a` S` V e'abWfi V[XXgeW [dSV[S` UW bcbad[a` S` V ekefW\_ VWe[Y` /egUZ Se SdSk b[fUZfi WfUZ FZW e[ g'Sf[a` dWeg'fe aX fdSU] [ Y YS[ bafW f[S^ V[XXWdW f SdSe SdWeZai ` [ fZWfST WZ

FST W&, FST WaXE[ g'SfFW 6SfS XadEgbWf dSU Bai Wd9W WdSf[a` 9S[ BafW f[S^

Location	Latitude	GCR	Proportion of diffuse irradiance	Shading loss		STA gain	SBA gain	Total gain
				Pvsyst	TrinaTracker model			
Singapore	1.37°N	0.70	56.00%	7.35%	7.35%	2.23%	5.88%	8.11%
Bangalore	12.99°N	0.64	41.70%	5.83%	6.73%	1.08%	5.38%	6.46%
Rangoon	16.70°N	0.64	55.30%	5.58%	5.58%	1.70%	4.46%	6.16%
Mexico City	19.43°N	0.60	42.30%	5.18%	5.18%	0.88%	4.57%	5.55%
Jeddah	22.30°N	0.58	39.40%	4.12%	5.59%	0.59%	4.47%	5.06%
Guangzhou	23.14°N	0.57	66.80%	3.78%	3.78%	2.26%	3.02%	5.28%
Columbia	34.01°N	0.46	45.60%	4.30%	4.30%	0.77%	3.44%	4.21%
Tongchuan	35.14°N	0.45	56.80%	2.56%	2.98%	1.16%	2.38%	3.54%
Hokkaido	43.23°N	0.33	54.10%	2.79%	2.79%	0.91%	2.23%	3.14%

Note: Shading loss SBA gain is calculated at the slope of 10° and the proportion of shaded arrays of 50%



4SeW a` eWXZVhWabW e[ g'Sf[a` eaXfi SdW Fd[ SF dSU] Wd eWwUfW fkb[US^ 'aUSf[a` e [ V[XXWdW f 'Sf[fgVWe S` V V[XXWdW f U[ SFW Ua` V[f[a` e fa e[ g'SfW fZW eZSV[ Y 'aee S` V WhS'gSfW fZW YS[ bafW f[S' FGHZEG6 geW fZW [ VgefckZi [W SgfZad[fSf[hW eaXfi SdW BHekef fa USdk agf e[ g'Sf[a` UZWU] [ Y a` fZWeZSV[ Y 'aee aX fkb[US^ 'aUSf[a` e[ i Z[UZ [e TSe[US^k Ua` e[efW f i [fZ fZW US'g'Sf[a` dWeg'fe aXF d[ Sie eWXZVhWabW eaXfi SdW

E9E hWd[XW fZWWhS'gSf[a` bcaUWe S` V dWeg'fe aXEgbWf dSU] YS[ ZEF 3 YS[ [e\_ S[ 'k SeeaU[SfW i [fZ fZWS` `gS^V[XXgeWbcbad[a` aX fZWbcaWUf e[fW [Z' fZWZ[YZVd fZWV[XXgeWbcbad[a` fZWYdMSfWd fZWEF 3 YS[ z8ad WY S\_ b'W [ 9gS` YI Zagf EF 3 YS[ [e STahW\$, -E43 YS[ [e SeeaU[SfW i [fZ 95Di fWdS[

e'abWS` V eZSV[ Y SdSk bcbadfa` t [ZVfZWYdMSfWdfZW95Df FZW'SdYWdfZWe'abWf FZW  
 Z[YZWdfZW eZSV[ Y SdSk bcbadfa` t S` V fZW Z[YZWdfZW E43 YS[ ž 8ad Wj S\_ b'W  
 E[ YSbadW Se S'ai ŽSf[fgVWSdMSf[e VWe[Y` W Se bWdefS` VSdV i ZWdW95D SUJag` fe Xad  
 S 'SdYWdfbcbadfa` t S` V fZWefSYWaXTSUJ fdSUJ [ Y 'Sefe XadS 'a` YWdfL W ea E43 YS[  
 ZSeSYdMSfWdbafW f[SžE9E Ua` X[d\_ W fZSf fZWYS[ dWeg'f [e dMSea` ST'WS` V dW[ST'Wž  
 3f fZWeS\_ WfL W 595 Ua` VgUfW S` SgfZad[fSf[hWhWd[XUSf[a` a` fZWSUJgdSuk S` V  
 WXXWJf[hW Wee aXfZWVSfSž;` [fe dWbadf fZW595 VdW fZWxa'iai [ Y Ua` U'geja` e, FZW  
 fWef [ Fa` YUZgS` 'SefW XadS kWSd S` V fZWdWeg'fe eZai fZSf bai WdYW WdSf[a` [ EgbWdfSUJ  
 SdSk i SeL bcahW Tk %ž' ( ž595 [ V[USfWe fZSf fZWfWef VSfS [e hS'Vž



# 7 Conclusions

FZW\_Sd] Wf eZSdWaXfZWfcdSU] [ Y ekefW\_ YdSVgS^k [ UaMSeWb VgWfa [fe XMSfgdWaX Z[YZ bai Wd YW WdSf[a` ž Fd[ SFcdSU] Wd ZSe S† Ske TWW Ua\_\_ [ffWw fa fWUJ` a^aYk [ `ahSf[a` † [ \_ bcah[ Y bai Wd YW WdSf[a` aXfZWfcdSU] [ Y ekefW\_ † dWgU[ Y >A57 S` V [ \_ bcah[ Y ;DDž EgbWdFcdSU] dW[Vb a` 4;? † ? [ ŽEZSV[ Y ? aVW` fa VWWb`k efgVk fZW bai Wd YW WdSf[a` UZSdSUWd[ef[Ue aXfZW\_ aVg`Wb Vb` S\_ [US^k eWW] abf[ S^fdSU] [ Y S` Y^W[ dMS^f[ W W ZS` UWbai Wd YW WdSf[a` g` VVd fZWUa` V[f[a` e aX Z[YZ V[XgW [cdSV[S` UWi WdSfZWd S` V Ua\_ b`Wj fWdS[ † S` V Y[hWXg^b`Sk fa fZWbai Wd YW WdSf[a` SVhS` fSYW aX fcdSU] Wd 5a\_ bSdW i [fZ Ua` hW f[a` S^fdSU] [ Y SYad[fZ\_ † fZW bai Wd YW WdSf[a` YS[ [ \_ bcahWbTk %ž\* , ž

EgbWdFcdSU] [e XMSfgdW i [fZ Z[YZ [ fW^fYW f bWdAd\_ S` UWS` V Z[YZ SVSbfST[†fk] Se i W^ Se eWXžbWdUmbf[a` † eWXžWsd [ Y S` V eWXžWU[e[a` Ž\_ S] [ Y† i [fZagf Zg\_ S` [ fWdW f[a` [ fZWabf[ [l Sf[a` bcaUMež3`ea[ [f Xg^k \_ SfUZWb Fd[ S fcdSU] Wd[ \_ WWfe fZW[hWbW WWe aXUgefa\_ Wd[ S` V US` TWXWj [T`k Sbb`fW fa V[XWdW f bca WUfež

FZdagYZ fZWagfVaad fWb a` \_ S` k bca WUf e[fWb Xad\_ adWfZS` S kWSd [f [e Xag` V fZSf EgbWdFcdSU] fWUJ` a^aYk [e efST`WS` V dW[ST`WS` V US` W egdWUa` f[ gage bai Wd YW WdSf[a` YS[ aX fZWfcdSU] [ Y ekefW\_ ž;` SVV[f[a` † fZ[dV bSdfk ZSe Ua` VgUfWw S` SgfZad[fSf[hWhWdX[USf[a` a` fZWW\_ b[d[US^VSfS† i Z[UZ [e SgfZW f[US` V WXXWUf[hWž

;` fZW ahWdS^Ua` fWj f fZSf ` W` W WdYk \_ Sd] Wf VWhWabe dSb[V`k† bZafaha`fS[U [ Vgefck [e \_ ah[ Y fai SdVe YdV bSdfk† S` V [fe WfWd S^bgd[ef [e fa [ \_ bcahWbai Wd YW WdSf[a` ž;` fZW XgfgdW EgbWdFcdSU] fWUJ` a^aYk i [^TWi [VWk geW [ Fd[ S fcdSU] [ Y ekefW\_ † fSb fZWbai Wd YW WdSf[a` bafW f[S^aXfZWfcdSU] [ Y ekefW\_ fa fZW\_ aef Wj fW ft \_ S] [ [l W ekefW\_ WXX[U[W Uk† dWgUW >5A7† Td[ Y Z[YZWd YS[ e fa Ugefa\_ Wd[ S` V Ua` fd[TgWfWfa SUZ[W h[ Y 5SdTa` BWS] 3` V 5SdTa` @WgfdS†fk fSdWfež

