

# Next2Sun

## Need of highly Bifacial Modules for vertical PV Systems

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# Agenda

- Next2Sun vertical bifacial PV system overview
- Impact of Bifaciality and Albedo in Next2Sun vertical PV application



# Next2Sun

- Agri-PV

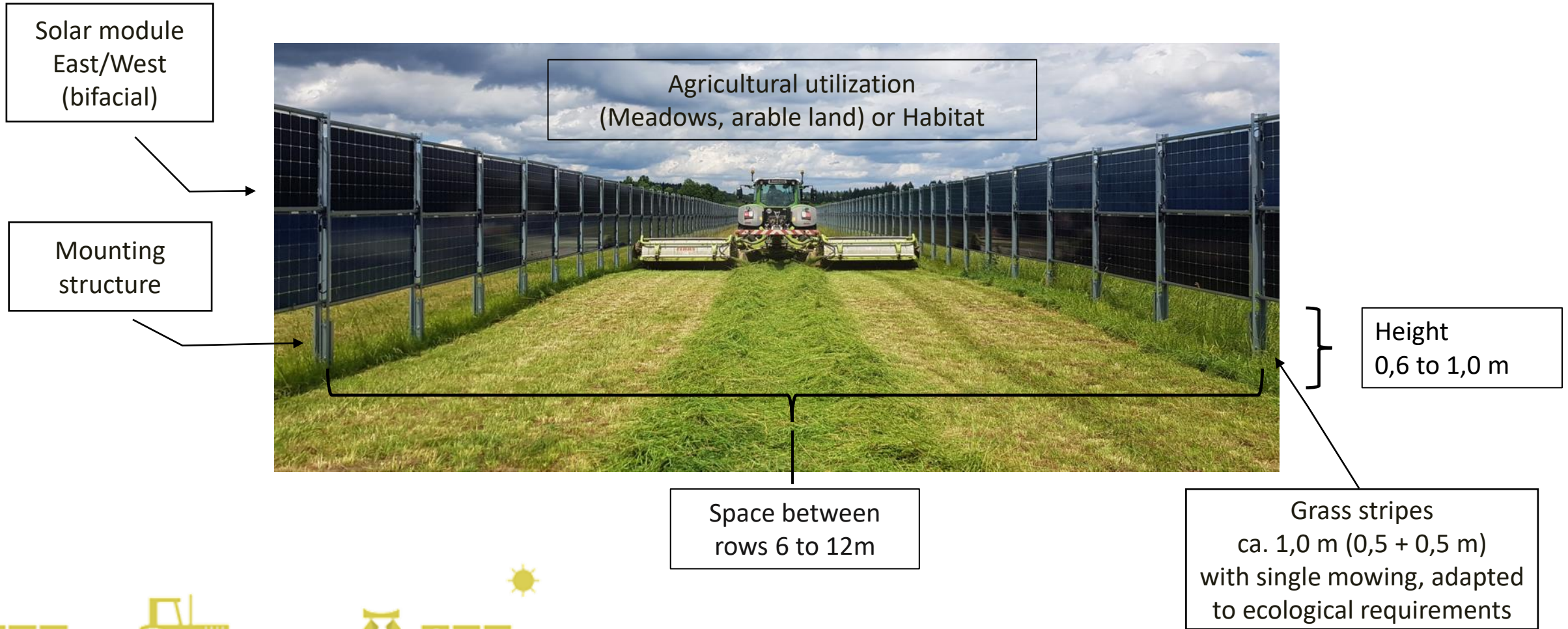


- PV Fence for private application

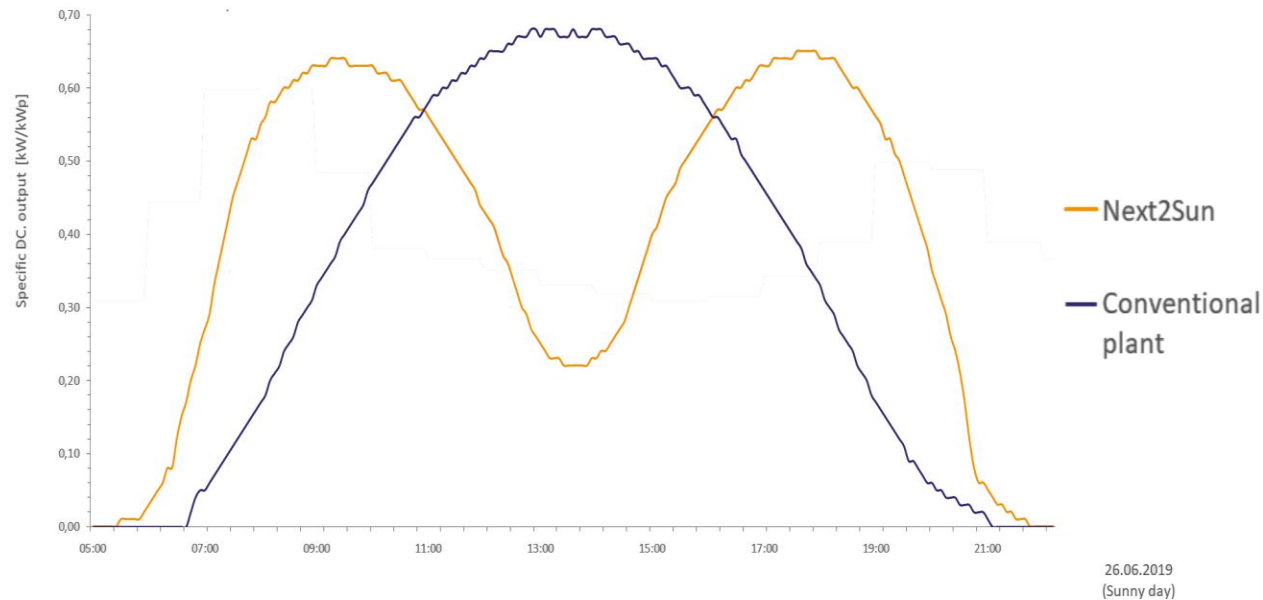




# Next2Sun System Design



# Benefits in the electricity market

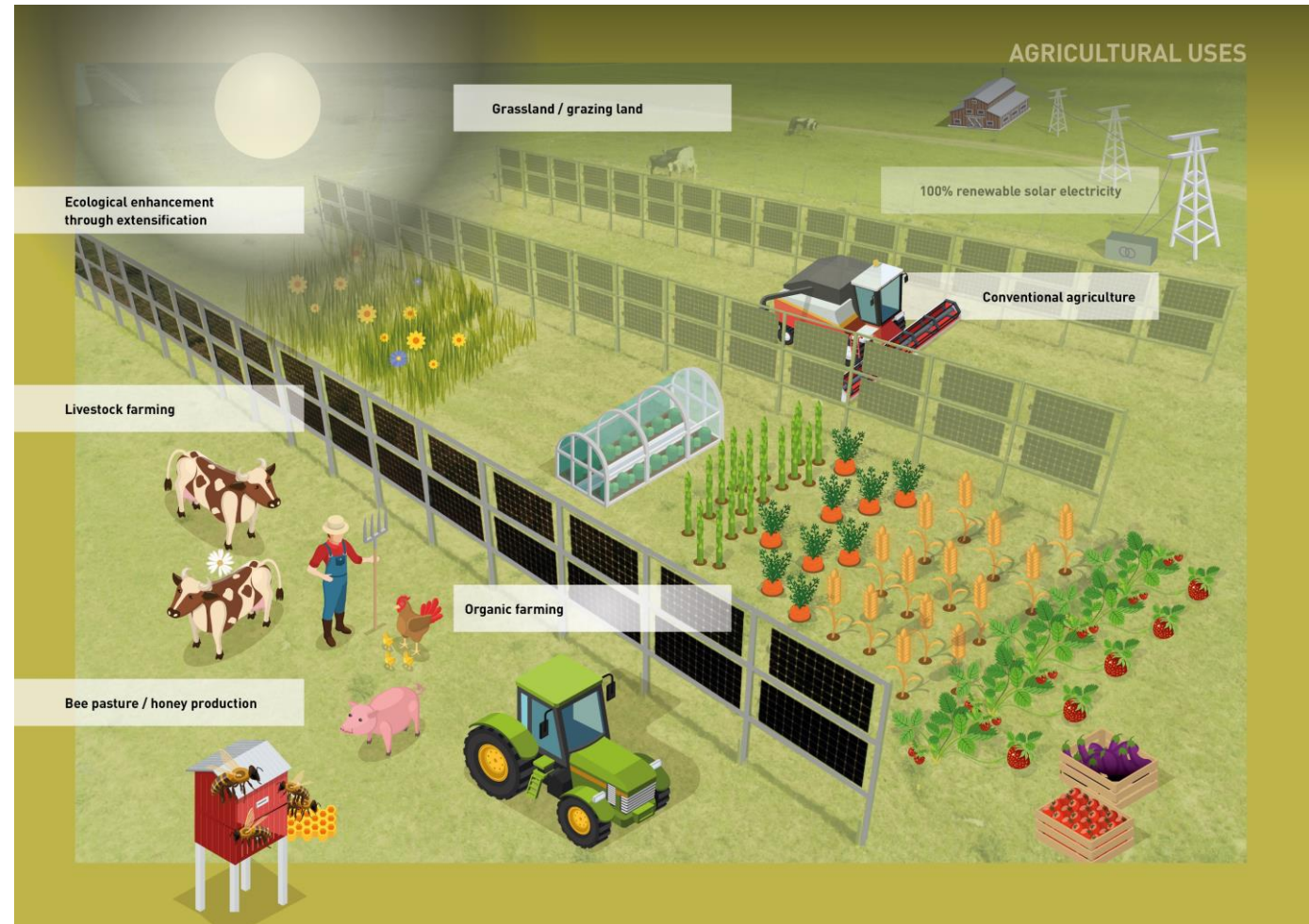


- Electricity prices are higher in the evening and in the morning and therefore vertical bifacial PV has an **extra revenue** from the market (in liberalized markets).
- About 5-10% higher costs for Next2Sun System
- 5%-10% higher electric yield especially with HJT
- additional 10% higher financial yield



# Permitting key aspects for Agriculture

- unchanged water supply by rain
- 85% of irradiation still available for agriculture on ground
- Less than 1% ground surface covered/blocked by PV System
- common agricultural use of remaining space





# Impact of Bifaciality with Next2Sun vertical PV



# Impact of Bifaciality

## Bifacial „Common“ South PV

- 5-15% additional Power by Modules „Backside“
- Only reflected diffuse Light available on Backside
- Additional Yield as „Add-On“

## Next2Sun vertical PV

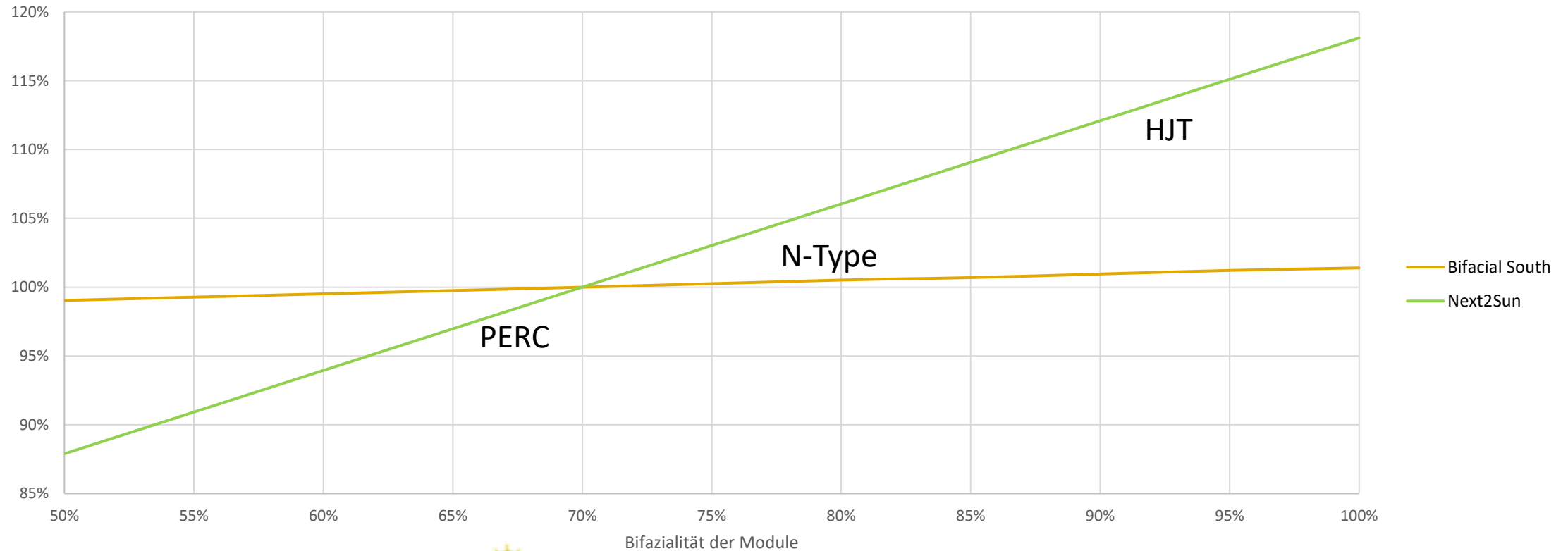
- 80-100% additional Power by Modules „Backside“
- Direct and Diffuse Light available on Backside
- About 10-12% higher yield with HJT instead of Bifi PERC





# Impact of Cell Type

Percentage of Additional Yield in Comparison to 70% Bifaciality



# Plantside in Dirmingen

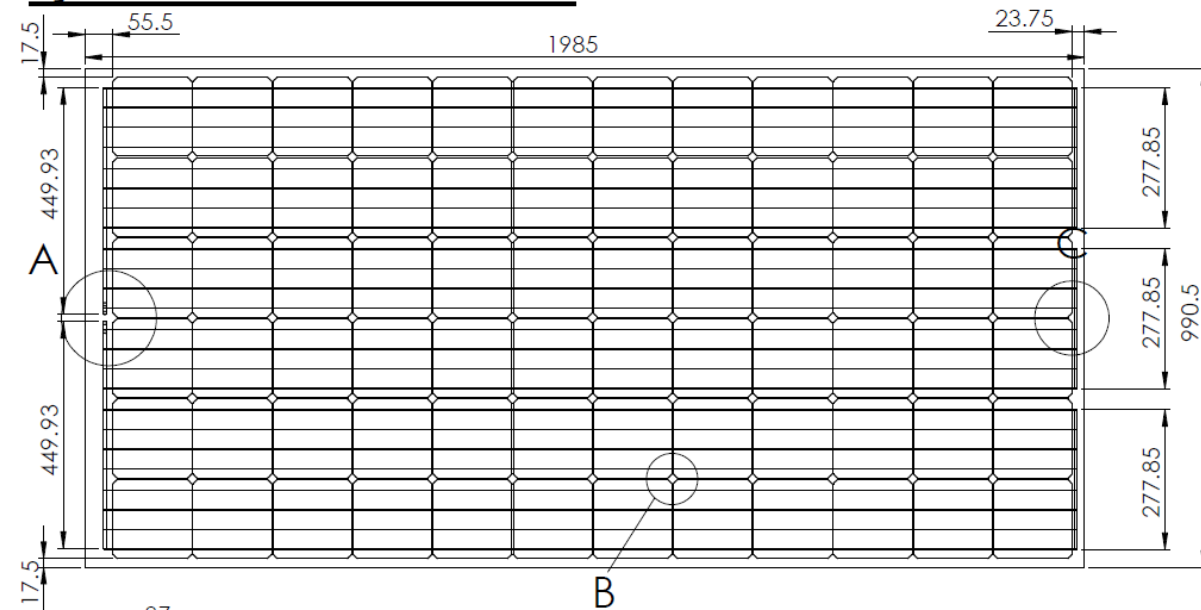
- Plantside of 2MWp seperated into:
  - 0,8 MWp **HJT Panels** (Sunpreme)
  - 1,2 MWp **N-Type Panels** (Yingli)



# Sunpreme Customized Bifacial HJT Panel

- HJT Technology
- 99% Bifaciality
- Customized Panel
- 800kWp installed Power
- high costs this time

**Symmetric Module GxB 380**

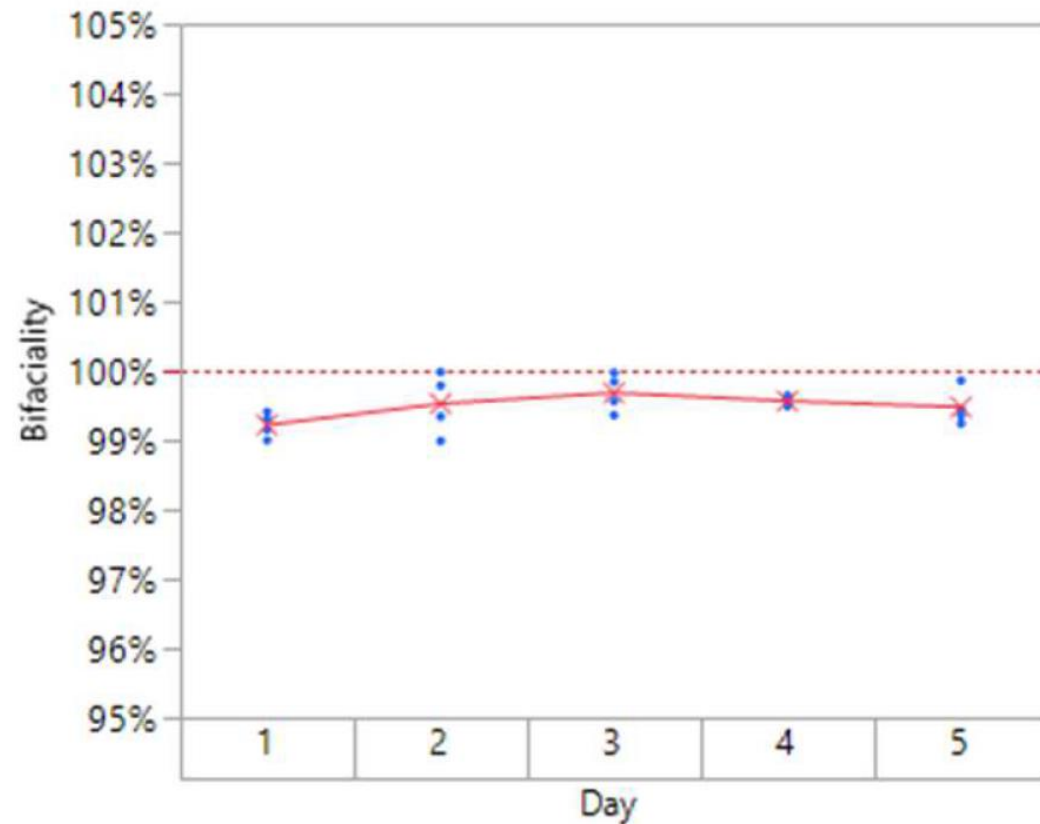




# Sunpreme Customized Bifacial HJT Panel

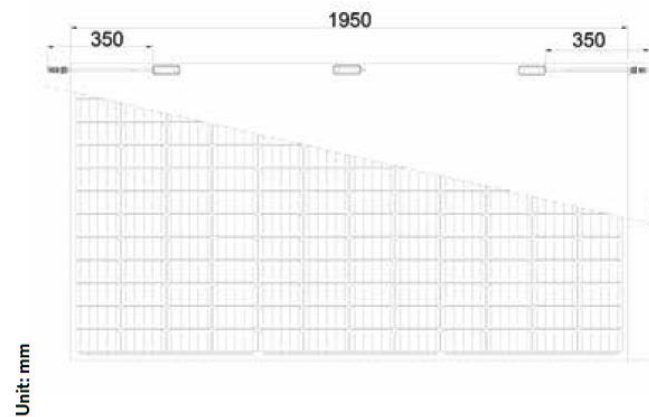
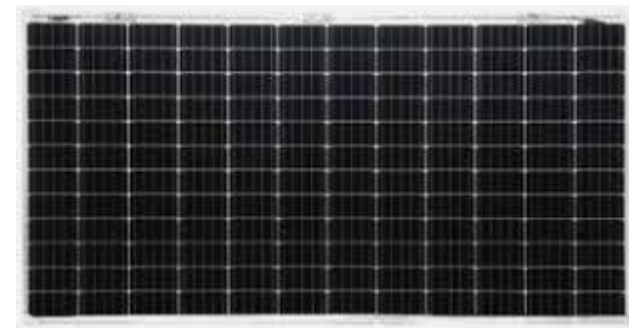
- Measured > 99,2% Bifaciality

Mean of Bifaciality by Day



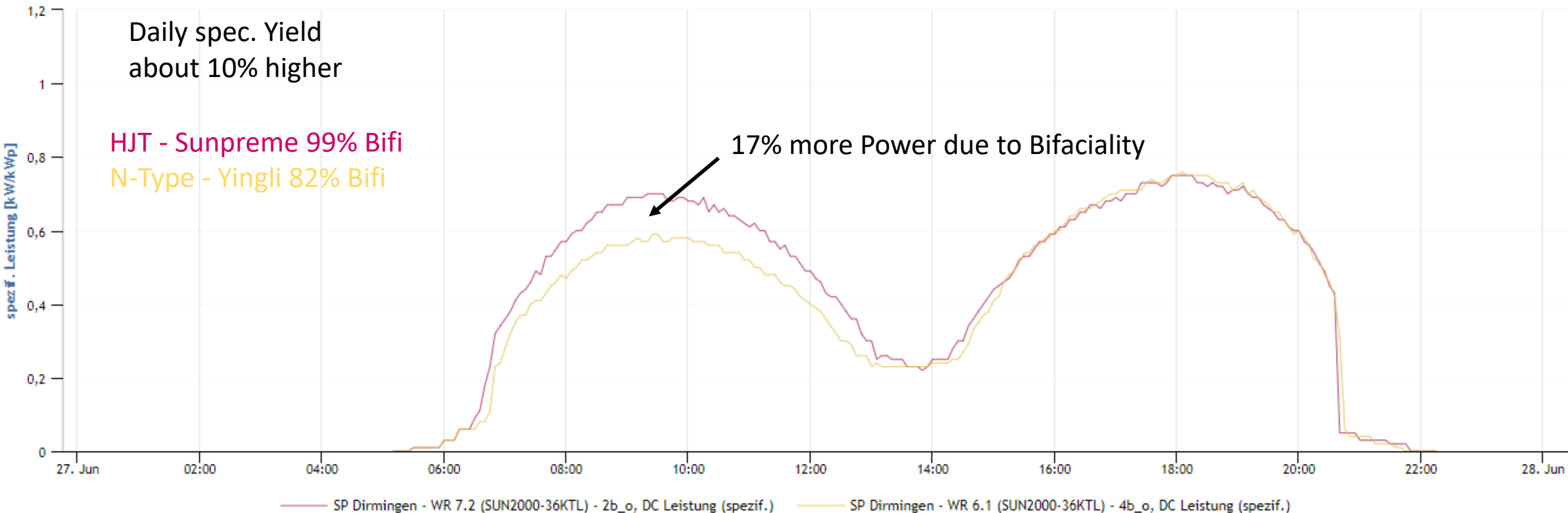
# Yingli Panda Bifacial 144 HCL Panel

- N-Type Technology
- 82% Bifaciality
- Half-Cut Cells
- 1200kWp installed Power
- Good substring layout



# Yield Comparison HJT <-> N-Type

27.06.2019



Databasis:  
Solarplant N2S Dirmingen  
June 2019



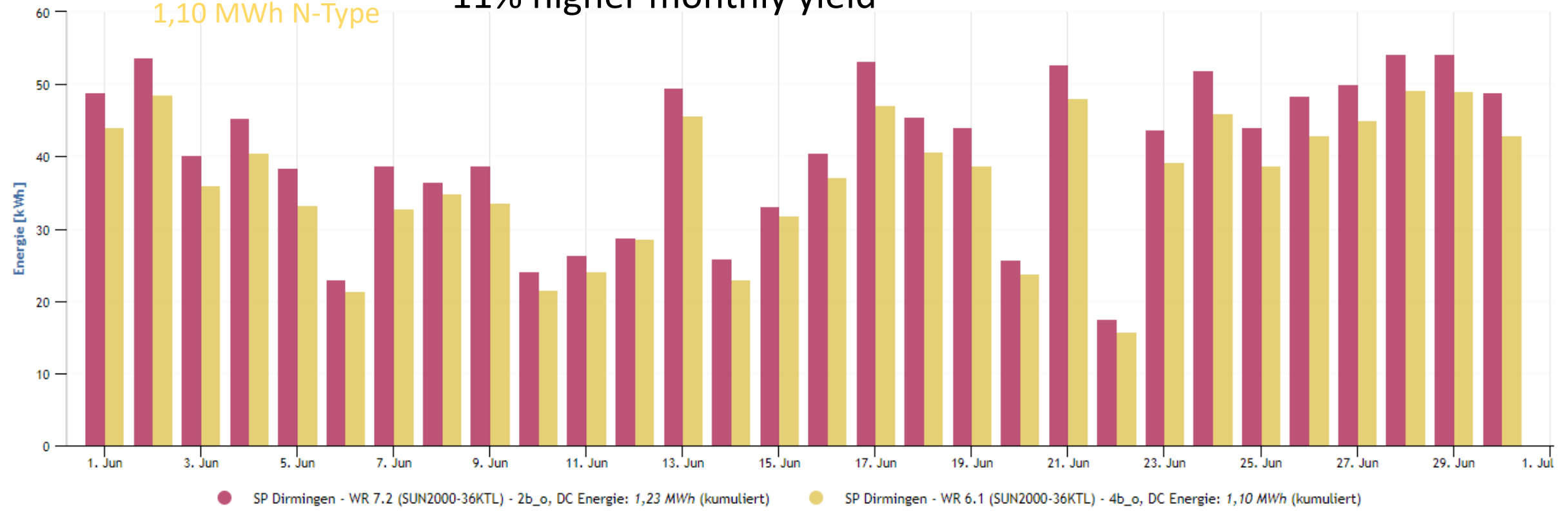


# Yield Comparison HJT <-> N-Type

1,23 MWh HJT

1,10 MWh N-Type

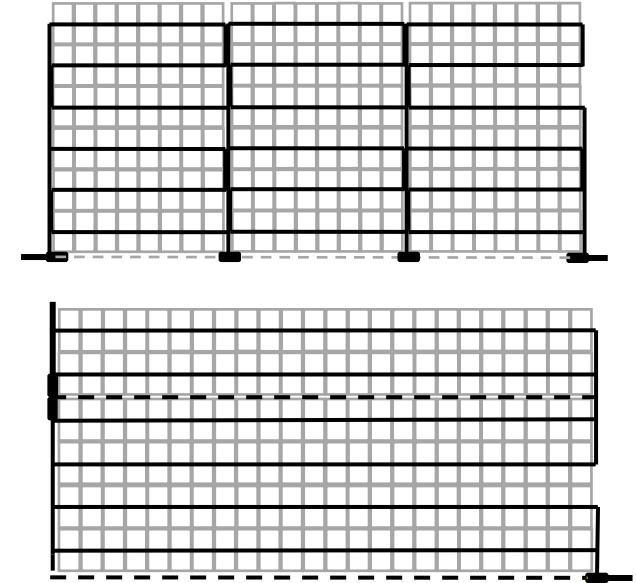
11% higher monthly yield



Databasis:  
Solarplant N2S Dirmingen  
June 2019

# Next2Sun Module Design

- Patent pending for Next2Sun module designs:
  - lower inter-row shading
  - easy string cabling
  - optimal Junction Box positioning for bifi application
  - cost effective production with common production lines
- Looking for production possibilities with module suppliers



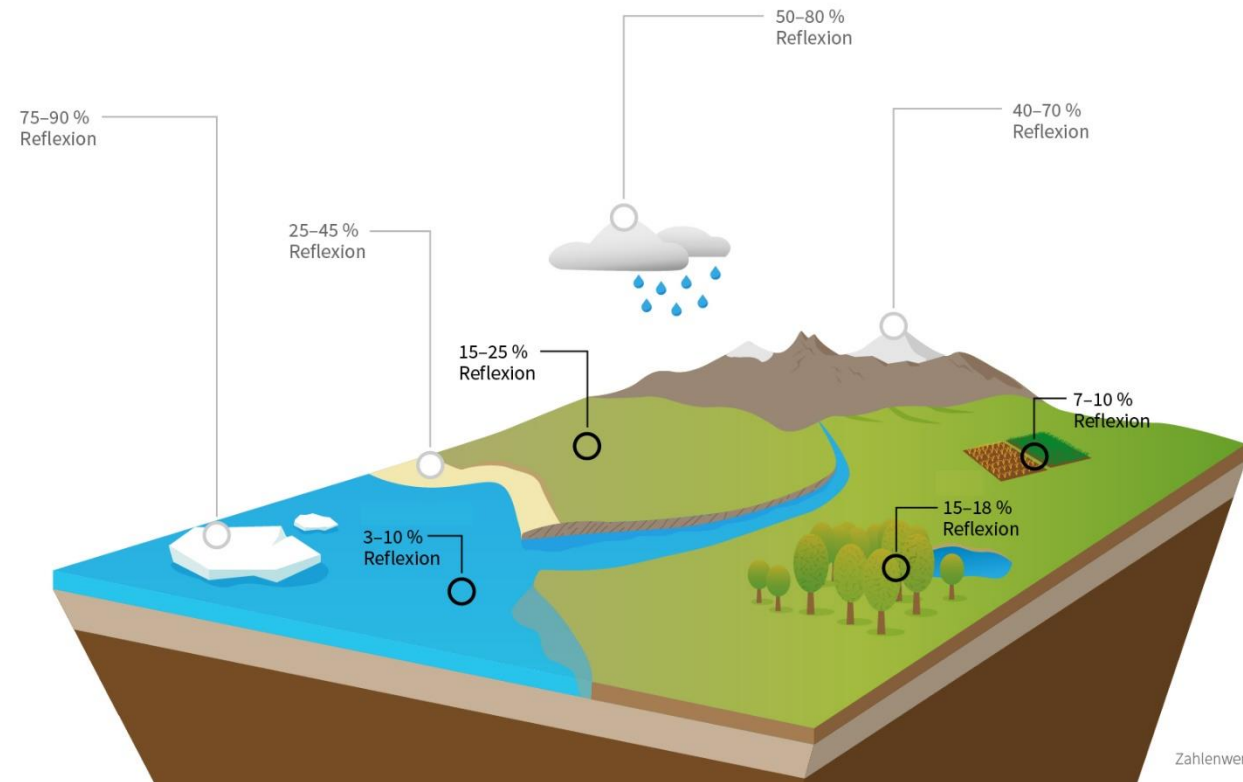
# Impact of Ground Albedo with Next2Sun vertical PV





# Impact of Ground Albedo

- Albedo is the diffuse reflected irradiance from ground surface
- Yield impact is much higher for vertical PV
- Additional yields under bad weather conditions



Zahlenwerte: CSC | Grafik: eskp.de / CC BY 4.0



# Donaueschingen snow covered



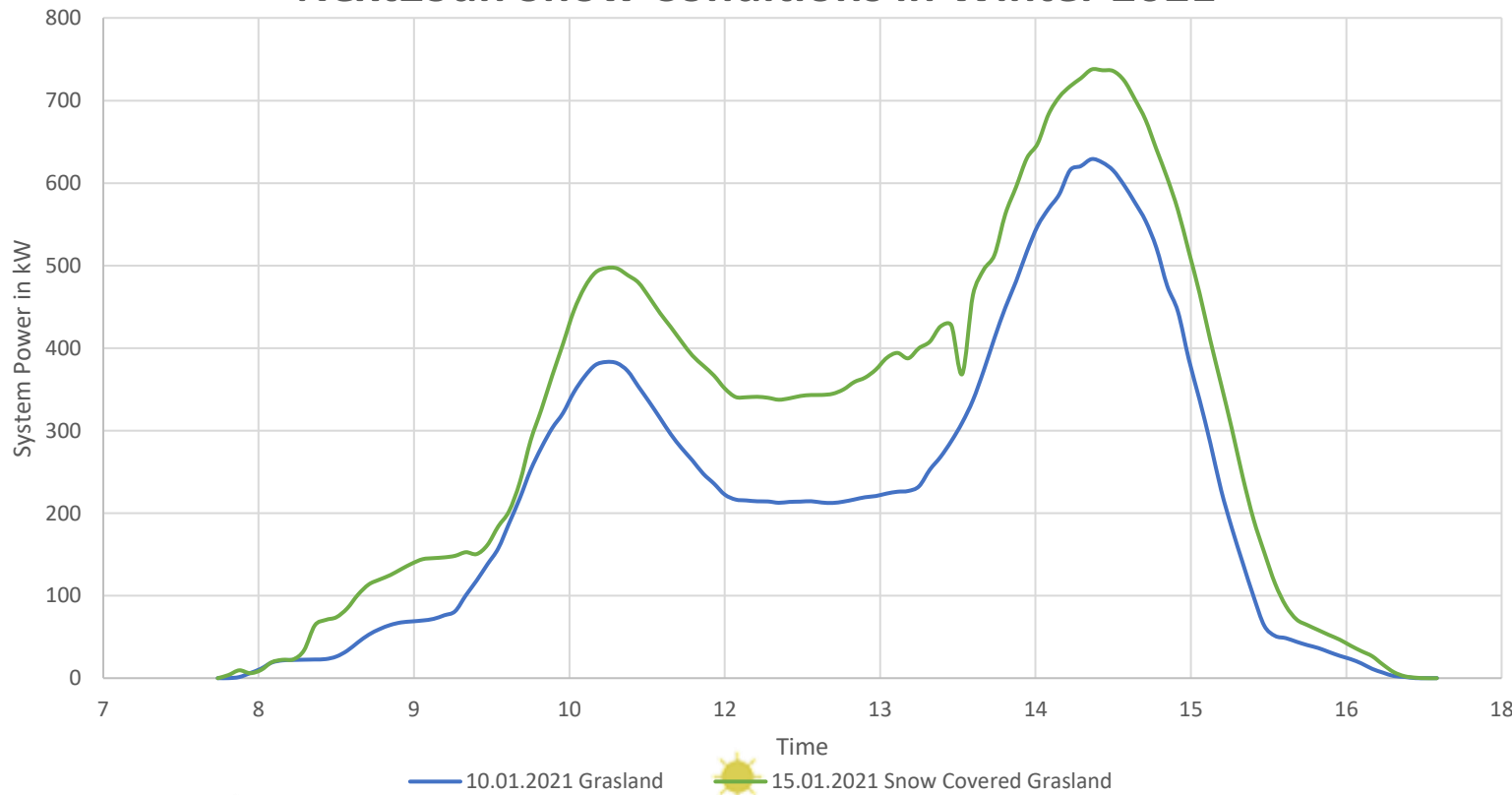


# Donaueschingen snow covered



# Additional Yield due to snow conditions

Next2Sun Snow Conditions in Winter 2021



- Measured: 38% additional electrical yield due to snow covered ground with high albedo and the Next2Sun PV System
- No additional snow load on module surface
- Common tilted systems would have even no yield at all under these conditions



# Chances for HJT and Next2Sun

- Next2Sun is looking for high bifaciality
- Next2Sun is able to handle high HJT prices  
2:1; price inc.:bifaciality inc.
- Next2Sun is willing to make HJT big scale
- **Let's go and get bifacial HJT the mainstream**





# Thanks for your Attention!

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Technical Engineering

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