



*a future with solar energy*



# *Why Solar energy?*

*Every 30 minutes  
the sun provides  
enough energy to  
supply the current  
world consumption  
of one year!*



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# *Why Solar energy?*

Sources of sustainable energy



Biomass  
Wind  
Sun

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# *Solar energy today*

- 1) Solar boilers:  
direct use of solar heat



- 2) CSP:  
Conversion  
of heat  
into electricity



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# *Solar energy today*

## 3) Solar Cells (PV) : direct conversion into electricity

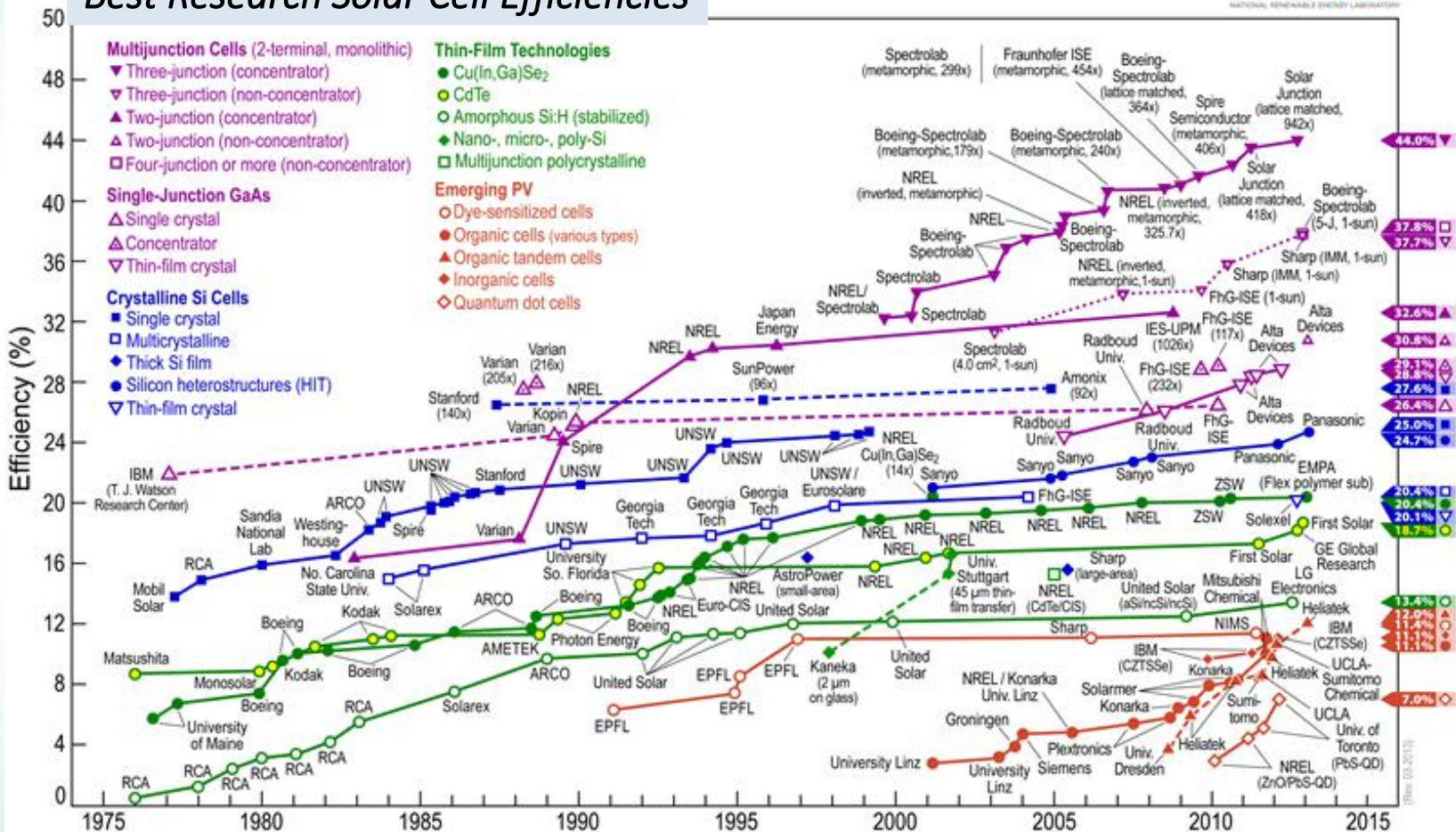
- Silicon: 90% of the market today
- Thin film technologies: coming up
- Organic solar cells: emerging technology
- III-V-solar cells:
  - = developed for application in space
  - = applicable in concentrators



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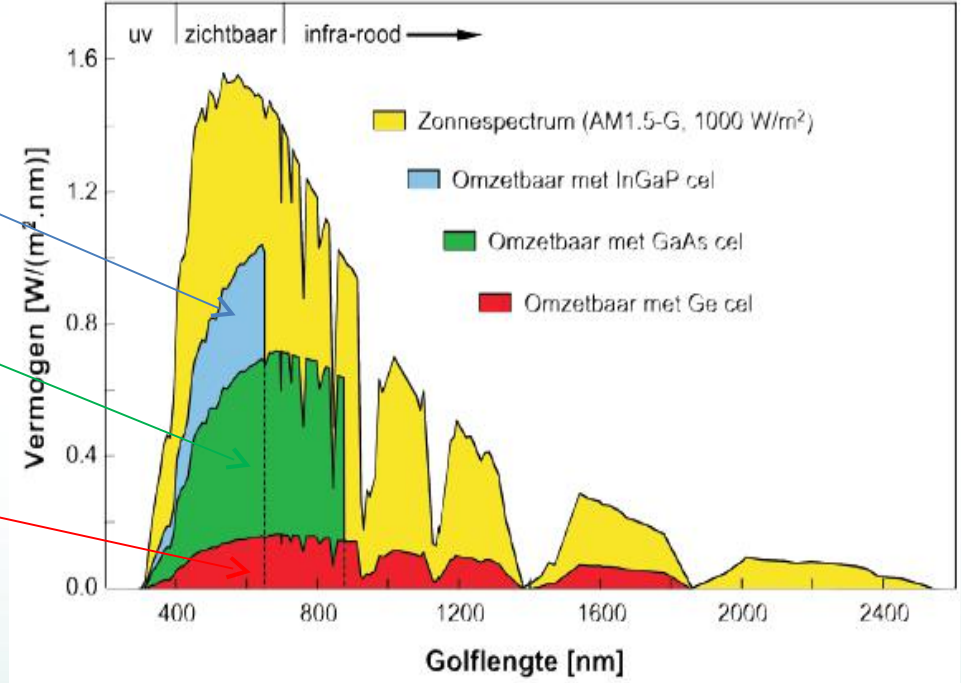
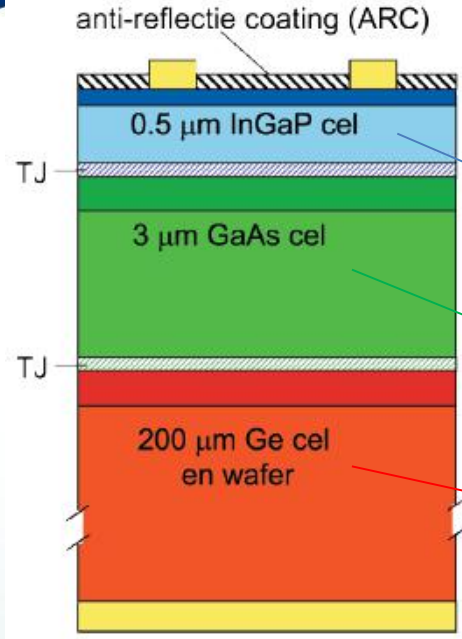


# Best Research Solar Cell Efficiencies





# III-V Solar cells



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# *Why concentrators?*



1. Replacing semiconductor material by cheap components
2. High efficiency by using III-V solar cells

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## *Concentrators and III-V solar cells*



Parabolic mirrors in Australia

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## *Concentrators and III-V solar cells*

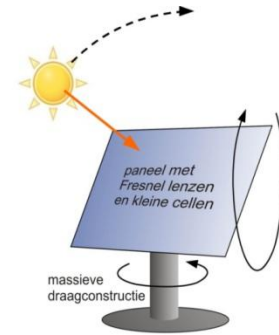


Concentrators – lenses in Spain

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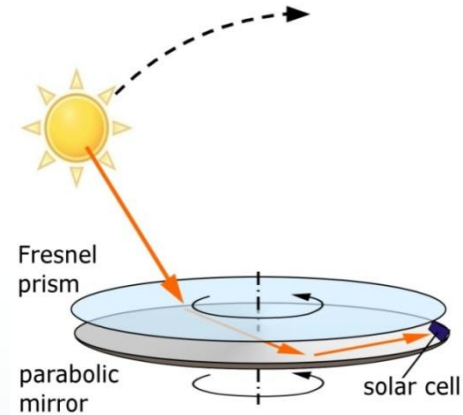
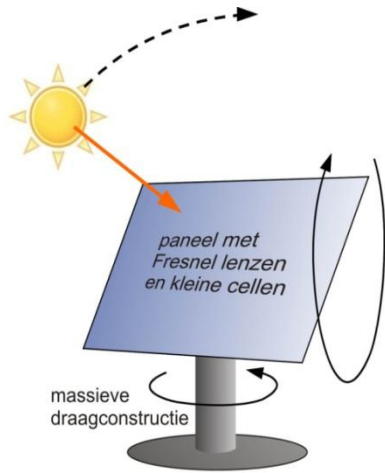
# Concentrator - issue



To follow the moving sun, a heavy and accurate tracking system is required:  
it is costly and can not be applied in the residential area



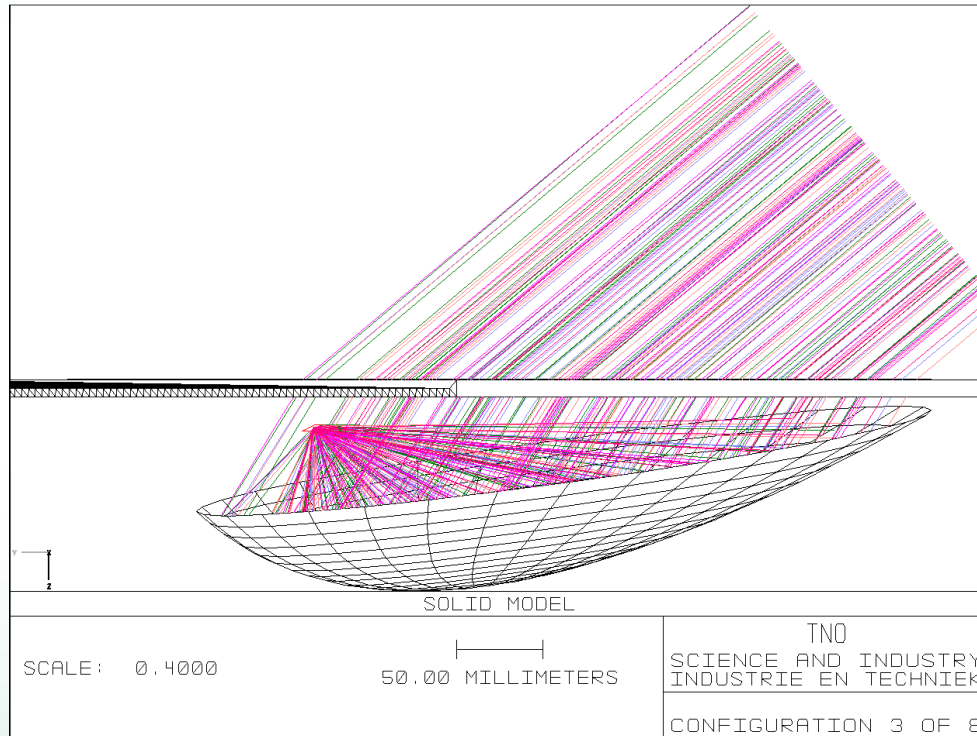
# *SunCycle solved that issue*



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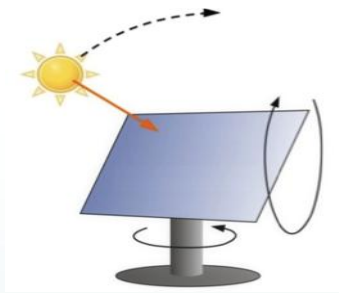
# How does it work?



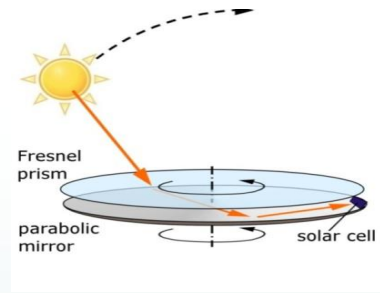


# How does it look?

*Traditional tracking CPV system*



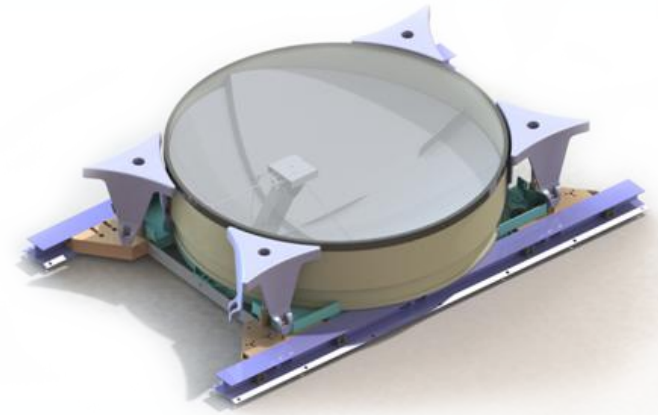
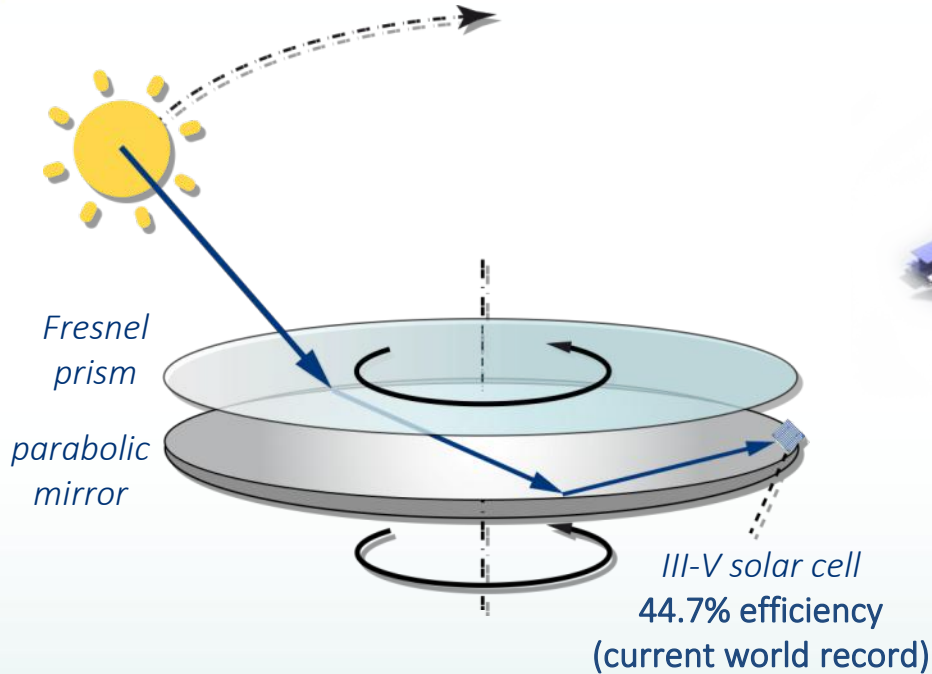
*SunCycle's solution: internal tracking*



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# *Internal tracking system*



*Technical 3D design  
of 1 module*

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*higher efficiency*



*electric & thermal energy*



*ideal for residential areas*



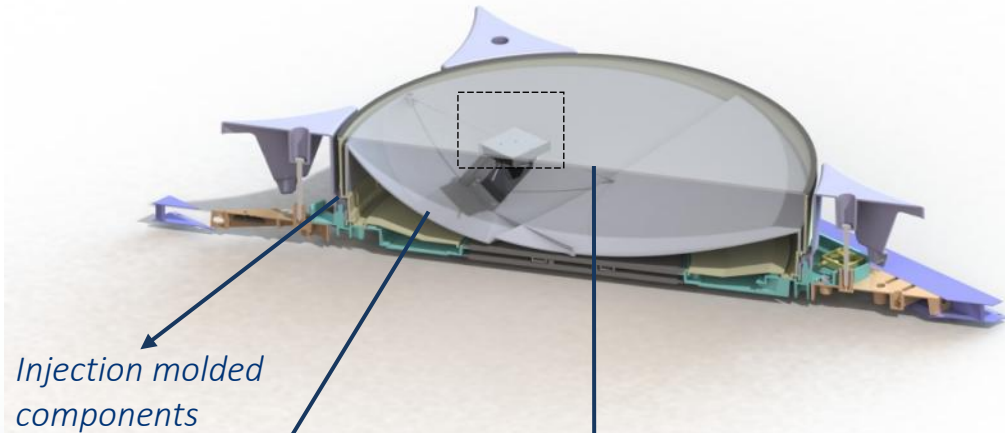
*almost 100% recyclable*







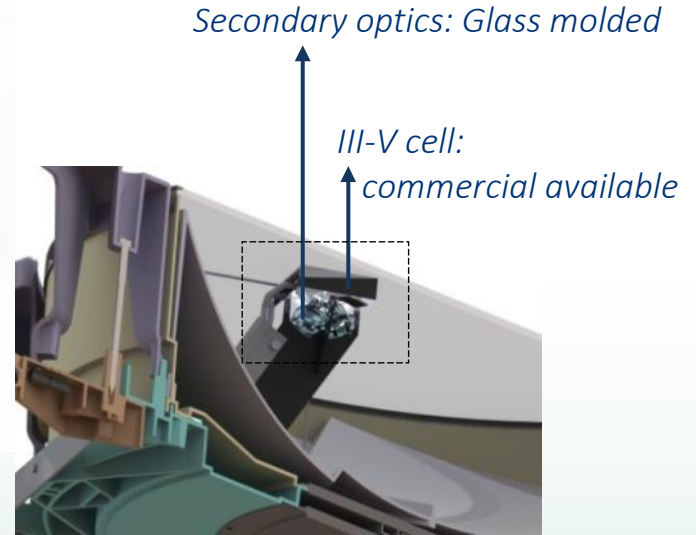
# Module components



*Injection molded components*

*Mirror:  
injection molded PC  
- coated*

*Prism:  
injection molded  
PMMA (Solar)*



*Secondary optics: Glass molded*

*III-V cell:  
commercial available*

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# *Module assembly*



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*Target market*



# *Interesting countries: high DNI*



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# *First countries of interest*



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# *First countries of interest*

- Fruit hangs low in sunny countries:
  - **France** (South), Spain, Balkan, Turkey
  - **Jordan**, UAE, Saudi Arabia, Egypt
  - **Tunisia**, Morocco

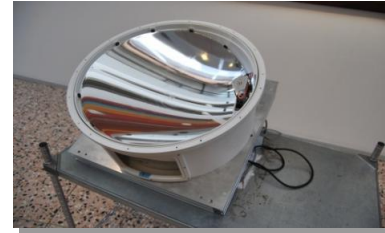
*About*

The image features a close-up, low-angle shot of tall, thin green grasses, likely a type of reed or grass, blowing vigorously in the wind. The blades are captured in motion, creating a sense of dynamic energy. The background is a soft, pale blue sky, which is slightly out of focus, emphasizing the texture and movement of the grass in the foreground.



# *SunCycle over time*

- 2006 • Technology patented
- 2007 • Proof of principle
- 2009 • Prototype in operation
- 2012 • Components produced with mass production technology
- 2013 • First series system produced and measured







# R&D Partners



GL Group

Radboud Universiteit Nijmegen



LEYBOLD OPTICS

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# *Subsidies*

## Grant Dutch Government

Production technology developed for all components of the system                      2010 – 2012



NL Agency  
Ministry of Economic Affairs, Agriculture and  
Innovation

## Grant European Union (FP7)

Scaling up to mass production line with a capacity of > 50 MW                      2013 – 2015

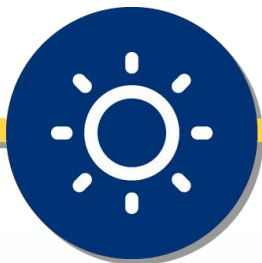


PSI Grant for market launch in Jordan with Jordan partner                      2014 – 2015



# *Business Planning*

**Product**



*December  
2013*

**Demo projects**



*Summer  
2014*

**Certification  
start**



*September  
2014*

**Market launch**



*2015*

**Next  
generation**



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