“Large Area Organic Energy Harvesting Films”
About Us
Technology leader in Organic Energy
Heliatek at a Glance

Development of organic materials and manufacture of HeliaFilm™

- First-revenue startup company
- Roll-2-roll manufacturing of solar films
- 80 employees, including 16 Ph.D.’s and 23 engineers
- 45 patent families
- Manufacturing: 1,200 m²
- Labs: 800 m²
- 3,000 m² available for expansion

Heliatek is an impressive example for the large development potential that the photovoltaic technology still has to offer."

Peter Altmaier, Chief of the German Chancellery
Our 4 Core Competencies
Unique in-house feedback loop for continuous improvement

Materials development
Chemistry lab in Ulm with 15 chemists specialized in organic materials

Stack architecture
Physics lab in Dresden with 16 physicists specialized in organic electronics

OPV business development
Experienced management and solar specialists for market entry

R2R production
First production site in Dresden with 23 engineers and operators
Organic Electronics: A Disruptive Technology
The future starts now
Markets & Applications
Enable our Partners to Innovate
Market Access via Partners in B2B channels
Yearly Market Potential

- 20 million m² of glass façade in Europe
- 66 million m² steel façade in Europe
- 20 million of glass car roofs in the world
Manufacturing
Unique R2R production
Proof of Concept Line (Gen-2 size)
Low temperature deposition in vacuum on film

- 30 cm wide PET-substrate
- Linear sources with low temperature vacuum deposition
- Laser scribing of P1, P2 and P3 structuring
- One vacuum roll coater integrates organic multilayer deposition, metal deposition, P2, P3 and first encapsulation
Pilot Project with AGC
Development of solar active glass

- Integration of HeliaFilm® into flat glass sheets
- North-East orientation
- Realized in August 2014
- 1 kWp installed capacity
- Significant energy harvesting demonstrated
- Energy being used 100% internally
Integration of transparent HeliaFilm® into car glass roof
The homogeneous surface and thin design allows smooth integration into glass car roof
Integrating HeliaFilm® into the car roof as a powering device helps car OEMs to achieve their CO₂ reduction goals.
FP7 R&D Projects

**X10D project:**
Members: [https://www.vdivide-it.de/x10d/public/partnerinfo](https://www.vdivide-it.de/x10d/public/partnerinfo)
Goal: tandem cell with 12% efficiency **Achieved:** triple cell with 12% efficiency = World record
Main focus Heliatek: new materials

**Manucloud project:**
Goal: concept for distributed manufacturing
**Achieved:** Adapted manufacturing execution system (MES) for such production in R2R process
Main focus Heliatek: MES system

**IMPROV project:**
Members: [http://www.fp7project-improv.eu/index.php?id=5](http://www.fp7project-improv.eu/index.php?id=5)
Goal: technology for infrared laser scribing **Achieved:** basic processes for infrared laser scribing for OPV
Main focus Heliatek: structuring OPV materials by Infrared laser
Proof of Concept Line – Financing

- Funding period: February 2010 – December 2013

- CAPEX funded by EU means @ 49% for small businesses
  - Investment grant from Saxony (3.9 Mio EUR)
  - Investment Allowance through federal government (2.6 Mio EUR)
  - Total: 13.3 Mio EUR

- R&D funded partially through FP7 projects at an average rate of 40%
  - Funding Total: 1.8 Mio EUR
Proof of Concept Line – Financing: What went well?

- CAPEX funding through investment grant was made soon after having made the payments (Little bridge financing needed)

- Adjustments to the original grant application could be made within the investment period with little bureaucracy (extension of investment period)

- Level of funding for R&D activities was adequate

- Very good communication with the funding authorities
Proof of Concept Line – Financing: What could be improved?

- CAPEX funding through investment allowance happens only in the fiscal year after the investments were paid (bridge financing needed)

- Number of jobs to be created for the CAPEX grant was difficult to estimate and changed during investment period

- For high-tech companies with high CAPEX need, the number of jobs that must be created for the investment grant could become difficult to achieve

- While R&D and Capex was subsidized, Opex was not: Gap → Valley of Death
TRL 6 → TRL 8: Timeline

- R&D
- Proof of Concept Line
- Pilot Line
- Volume Market Entry

- 2006 .... 2014
- 2016 ... 2018
- 2019 ...

© Heliatek GmbH  www.heliatek.com
2014 / Confidential
KET Pilot Line 18
Heliatek KET Pilot line Meets EU Research Agenda

1. Automotive & Transport

2. Energy Efficiency

3. Semiconductor Process and integration

4. Equipment, Materials and Manufacturing
Heliatek KET Pilot Line Addresses Societal Challenges

- Secure, Clean and Efficient Energy
- Climate action, environment, resource efficiency
- Smart Green and Integrated Transport
EU Content & Impact

- Universities & Research Centers
- Material & Equipment Suppliers
- Heliatek Pilot Line

Building & Construction Material
Automotive Supply Chain
Organic Cluster in Saxony
Heliatek Partner companies

Concrete

Glass

Metal

Polymer sheets

Foil

Textile Membrane

PVC Membrane
Our Planned Gen5 R2R Pilot Line:

- **120 cm** wide PET-substrate = required industry standard
- Linear sources with low temperature vacuum deposition
- New encapsulation concept
- One vacuum roll coater integrates organic multilayer deposition, metal deposition, lasering and first encapsulation
The Gen5 R2R Pilot Line - A Key Success Factor

- Heliatek is well positioned to successfully demonstrate Gen5
- Gen5 is a major technological step with a “high risk – high reward” profile
- Gen5 requires a budget of about 65 million Euro over 36 month

- The amount of private equity available to the Gen5 pilot line project is quite limited due to its “first in kind” risk profile.
- R&D funding is inevitable to bridge this “valley of death”.
Thank you for your attention.

www.heliatek.com