# DOUBLING SOLAR PANEL EFFICIENCY

SWISS US Energy Innovation Days
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EPFL Innovation Park, Ecublens

# Company background

Technological startup launched in September 2015

Based at the Swiss Institute of Technology Lausanne (EPFL)

Goal: bringing innovations to solar energy harvesting based on optics

ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

# Team

**Laurent Coulot**
**CEO & Co-founder**

**Mathieu Ackermann**
**CTO & Co-founder**

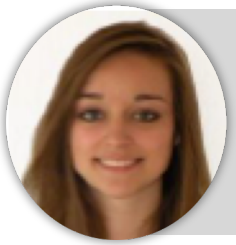
**Florian Gerlich**
**COO & Co-founder**

**Noé Bory**
**Lighting manager**
Lighting technical and business activities

**Avaro Aguilar**
**Electronic Engineer**
Electronic and testing

**David Olsommer**
**Mechanical Engineer**
Prototypes and industrialization

**Hélène Monari**
**Project manager**



**Laetitia Anglade**
**Engineer**
Pilot site

**Alan Rosling**
**Board member**
Chairman at Griffin Growth Partners Limited

**Rainer Isenrich**
**Board member**
CEO Edisun Power Europe

# Solar industry is growing fast but facing major challenges

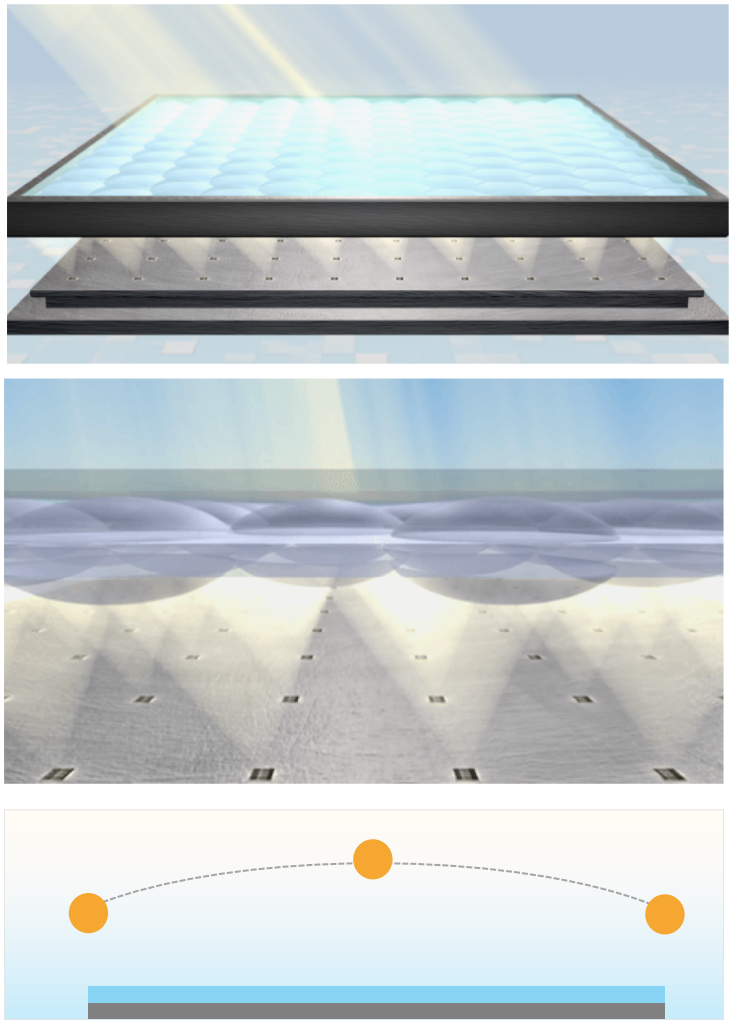
- **Weak market penetration**
  1% world electricity
- **Rooftop market relies on subsidies**
  which are dropping
- **No more leverage on decreasing costs,**
  dominated by installations & labor (80%)
- **Anemic gross margins**
  13% average for panels manufacturers
- **Limited efficiency with current technologies**
  approaching their max at 22%

**NEED**

Boost module efficiency to bring solar electricity costs down on rooftops

SOURCE: *SIEA - 2016*

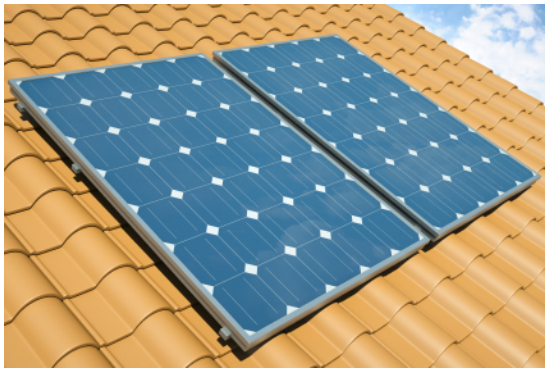
# Insolight presents the most efficient flat module



- Sunlight is **concentrated** on an array of highly efficient micro solar cells (III-V).
- **Integrated** micro-tracking (panel not moving)
- Standard **flat panel** frame

# Modules technologies comparisons

## CONVENTIONAL PV



- SIMPLE & RELIABLE
- ROOFTOP & UTILITY
- LOW EFFICIENCY (≈20%)

## CONCENTRATED PV

- HIGH EFFICIENCY (>30%)
- COMPLEXITY
- UTILITY-SCALE ONLY

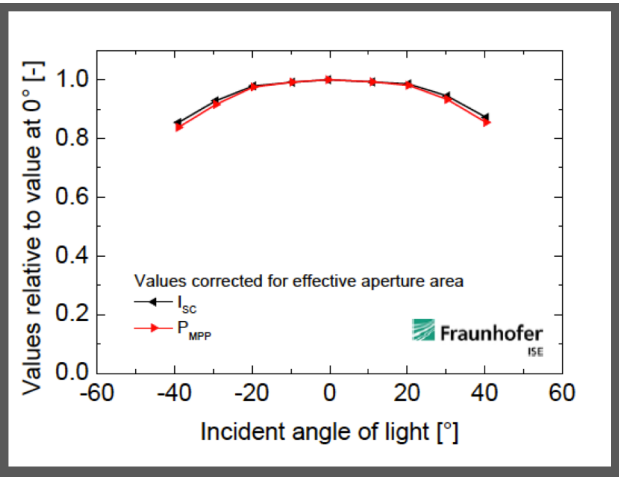
## INSOLIGHT

- HIGH EFFICIENCY (>30%)
- INTEGRATED TRACKING
- ROOFTOP & UTILITY

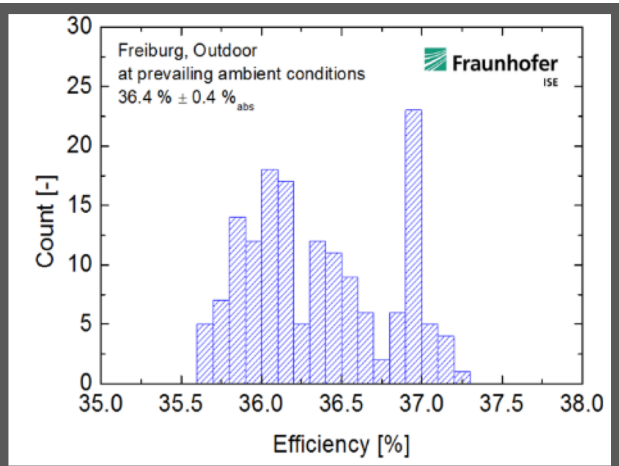
# Third party validation proves new efficiency record at 36% on mini-module (2016)

Fraunhofer ISE

**Third Party validation** of the prototype




- **+/- 40 degrees acceptance**, which proves that the panel can be mounted at fixed orientation on a roof




- **36.4% efficiency** According to Fraunhofer experts, this could be a **new world record of efficiency** for a flat-module

# Pilot Installation (2018)

- Functional modules connected to the grid
- Complete monitoring system with live data analysis 24/7
- **Peak module-level efficiencies recorded at ≈30%**

**EPFL, Lausanne (Switzerland), June 2018**

# Insolight would not only present the most efficient but also the most economic flat panel in the market

## Residential California

| | Standard Panel | Insolight Panel | |
|---|---|---|---|
| Efficiency percent | 18 | 36 | +100% |
| CapEx USD/sqm | 70 + BOS & installation: 550 = 620 | 300 + BOS & installation: 550 = 850 | +35% |
| Cost USDc/kWh | 14 | 9 | -36% |

*1 Assuming net metering at 0.13 $/kWh, no subsidies, and neglecting interest rate effects*

# Blueprint licensing for production and distribution

Research and development → Production → Distribution → After sales

insolight

**JOINT PARTNERSHIP FOR PRODUCTION**

# To enter the solar panel market, we need to demonstrate the performances in outdoor conditions

| Third Party validation | First pilot site running | Multiple pilote sites and reliability testing | Customer(s) acquisition | Licensing revenues |
|---|---|---|---|---|
| ✓ | ✓ | *2018* | *2019* | *2020* |

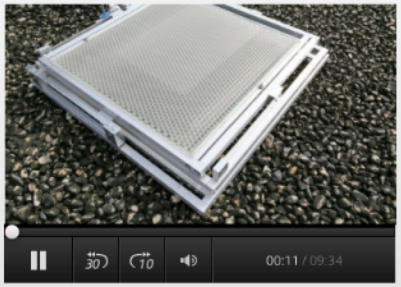
# Seed Round (Closed in Q1 2018)

| CHF 2.3 Mio |
| --- |
| • Product pre-industrialization<br>• First pilot sites (100m$^2$/40kW)<br>• Strengthen IP<br>• Product qualification to norms<br>• Product ready for mass production<br>• Partner/customers acquisition |

PLAY RTS

Vidéo | Radio

Accueil | Direct | Émissions par date



CQFD, 08.09.2016, 10h04

## Des panneaux solaire plus efficaces

Une surcouche optique permet de multip l'efficacité des panneaux solaires résider innovation proposée par une start-up de fédérale de Lausanne (EPFL) pourrait rer concurrentielle la production d'énergie s avec Laurent Coulot, ingénieur en microt fondateur de la start-up Insolight, interr Confino.

00:11 / 09:34

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## Why this solar panel could be the next big energy player

**6 October 2016** Last updated at 08:25 BST

pv magazine

PHOTOVOLTAIC MARKETS & TECHNOLOGY

**Ultra-high efficiency arrays being developed for the residential PV market**

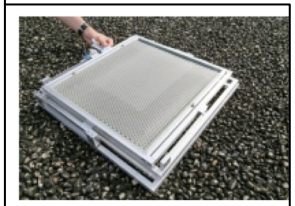

**図1 Insolight社が開発中の集光型太陽光パネル**

（出所： EFPL/Alain Herzog）

Clean Technica

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## Space Age Solar Cells, Coming Soon To A Rooftop Near You

September 7th, 2016 by Tina Casey

# Thanks for your attention

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