



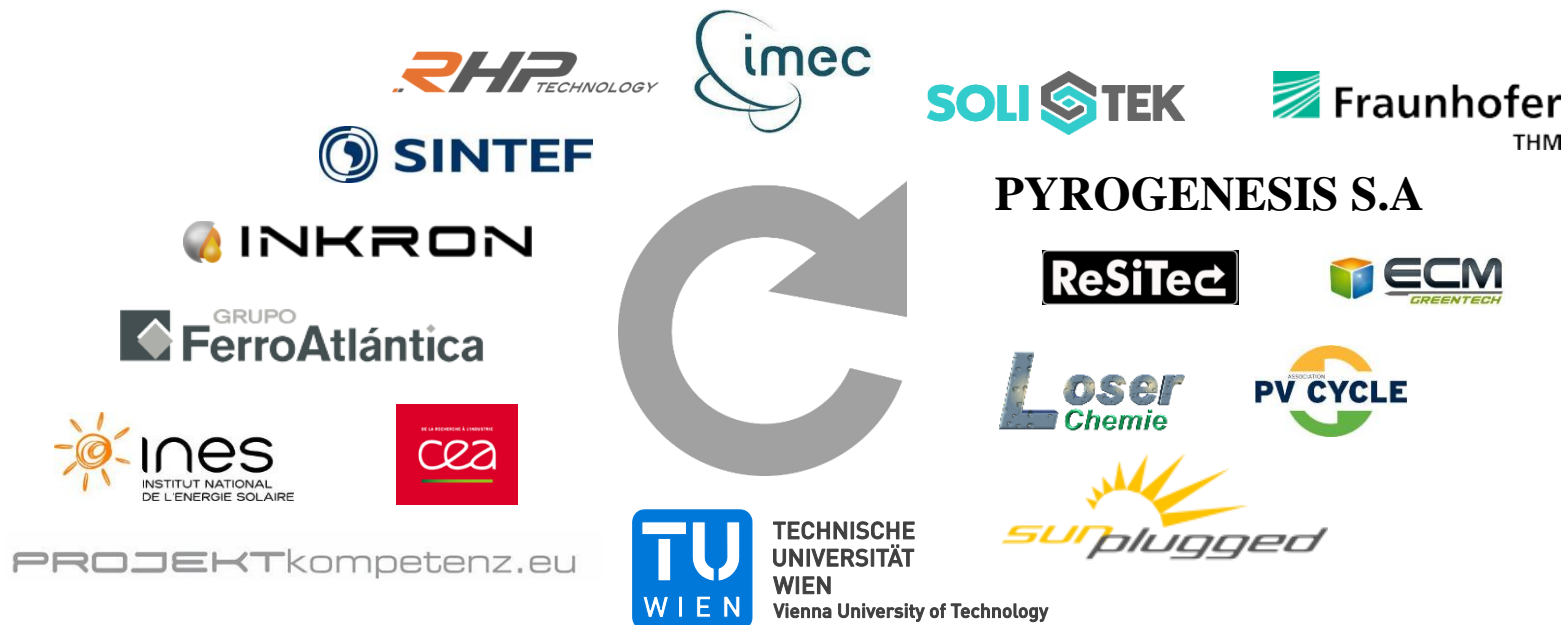
CABRISS

HORIZON 2020 –  
Climate challenges and Austrian- French research partnership



H2020 – WASTE 1-2014

CABRISS





# Main project features



CABRISS

- **CABRISS:** IMPLEMENTATION OF A CIRCULAR ECONOMY BASED ON RECYCLED, REUSED AND RECOVERED INDIUM, SILICON AND SILVER MATERIALS FOR PHOTOVOLTAIC AND OTHER APPLICATIONS
  
- **HORIZON 2020 CALL**
  - ✓ Waste: A Resource to Recycle, Reuse and Recover Raw Materials
  - ✓ WASTE-1-2014: Moving towards a circular economy through industrial symbiosis
  
- **TYPE OF ACTION:** Innovation actions
  
- **Project key features**
  - ✓ Project duration: 36 months
  - ✓ Budget: 9,281,682.25€
  - ✓ EC Contribution: 7,844,564.54€
  
- **Coordinator:** CEA (French Alternative Energies and Atomic Energy Commission)
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# Main project features

CABRISS

## ➤ CONSORTIUM

- ✓ 16 partners from 9 countries
- ✓ 6 SMEs and 5 Industries
- ✓ 5 RTO

## ➤ TIMELINE

- ✓ Official starting date: June 1<sup>st</sup>, 2015
- ✓ Kickoff meeting July 7<sup>th</sup>-8<sup>th</sup>, July 2015





**CABRISS** aims at pioneering a **circular economy** dedicated to handle the critical situation of **recycling the important amount of photovoltaic waste** and benefiting also to **electronics, metallurgy and glass industries**.

## Five main objectives :

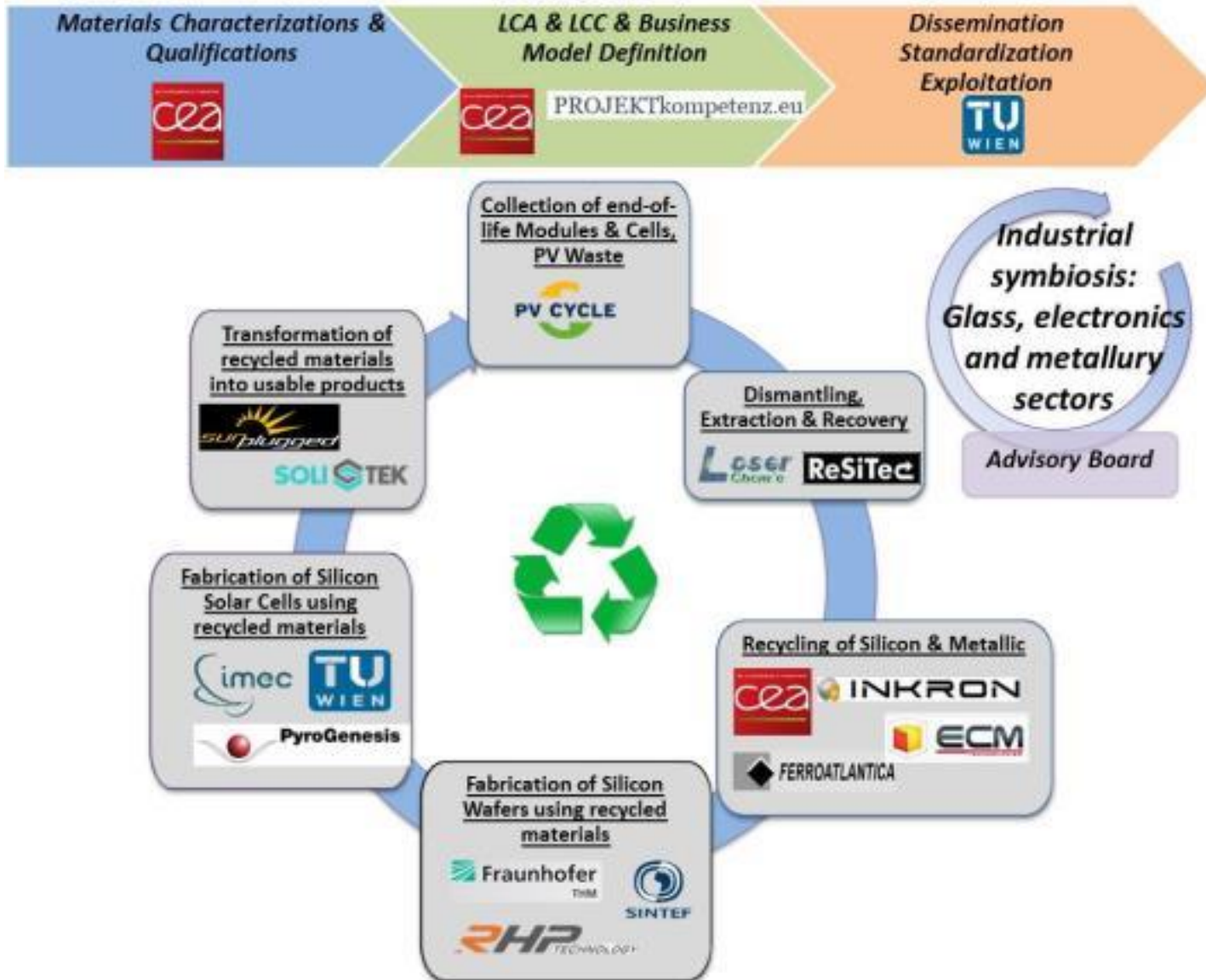
- Developing industrial symbiosis by providing raw materials **such as glass or silver pastes** as feedstock for other industries (e.g. Glass, electronics or metallurgy).
- Collecting up to **90% of the PV waste** throughout Europe compared to the 40% rate in 2013.
- Retrieving up to **90% of the high value raw materials from the PV cells and panels: Silicon, Indium and Silver**.
- Manufacturing PV cells and panels from the recycled raw materials achieving lower cost (25% less) and at least the same performances (i.e. cells efficiency yield) as the conventional processes thanks to the **implementation of a solar cell processing roadmap**, which uses Si waste for the high throughput, cost-effective manufacturing of hybrid Si based solar cell.
- Involving the EU citizens and industry into such a sustainable and financially **viable new economy**. Namely, EU PV manufacturing industry will be given a new momentum allowing them **to reach 50% of the EU market by 2020** (vs 24% in 2013).



# CABRISS Value chain



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# Study cases/pilots foreseen

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Works in **CABRISS** are based on **industrial scale process lines** all along the value chain:

- **Collecting/dismantling**: selected tens of tons of PV waste will be dismantled to constitute raw materials feedstock's to recycle **available**
- Industrial demonstration will be done for the **conventional route for PV industry**: solar silicon purification, crystallization, wafering, cells processing, modules processing. Demonstration with the production of:
  - ✓ several ingots (G5 size – 450kg) **available**
  - ✓ hundred of cells
  - ✓ tens of modules, different technologies
- Demonstration at the largest possible scale will be done for **the PV innovative route** (kerfless route production of cells): **pilot after CABRISS**





- **10 tons of PV panels** will be dismantled and recycled during the project CABRISS
- **Life Cycle Assessment:**
  - ✓ The following metrics will be used in CABRISS project:
    1. The average emission of greenhouse gases per 1kWh of electricity produced ( $\text{gCO}_{2\text{eq}}/\text{kWh}$ ) and in total ( $\text{tCO}_{2\text{eq}}$ ).
    2. The primary energy required to produce 1Wp of solar panel ( $\text{GJ/W}_p$ ).
    3. The energy pay-back time (EBPT) in years.
- **Life Cycle Costing:** The overall cost of new processes will be monitored. The target is to develop new routes with lower costs
- The global process flow of CABRISS will be validated through verification by the EU **Environmental Technology Verification Pilot** (ETV) program and support the implementation of the roadmap of the SPIRE PPP.
- Needs and opportunities for **close loop introduction in the PV sector** will be assessed by involving the **European PV clusters and the industrial User Group** for exploitation on other markets and develop transdisciplinarity between different sectors.



- **Historical opportunity to develop a circular economy for the photovoltaic benefiting also for the electronics, metallurgy and glass industries.**
  
- Greater chances of success with close **interactions outside the consortium:**
  - ✓ Two open workshops will be organized within CABRISS
  - ✓ Call for discussion/collaboration to extend potential exploitation domains
  - ✓ Ask for a **strong synergy with the SPIRE network**





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<http://www.spire2030.eu/cabriss/>