

IGNITING THE FUTURE

SoldAC

*meets
the*

MARKET



Industrial Workshop | 25th June 2025 - Barcelona (Spain)



This Project has received funding from the European Union's Horizon Europe research and innovation programme under the Grant Agreement no. 101069359, and from UK Research and Innovation - Innovate UK under Innovation Funding Service (ISF) 10039331 and 10038044.

Organised by **LOMARTOV**
[Applied Innovation Engineering]



AGENDA

09:30 – 09:45 Opening session - Aim and the structure of the workshop

Session 1 – SoldAC's outputs showroom

SoldAC sub-units on stage – an opportunity for joint or individual exploitation.

09:45 – 11:00

- Direct Air Capture unit - *Giulio Santori, University of Edinburgh, Paul Wright, University of St Andrews & Valeria Palomba, National Centre for Research Italy.*
- Photoelectrochemical cell – *Juan Ramon Morante, Catalonia Institute for Energy Research.*
- Full Spectrum Solar system – *Daniel Chemisana, University of Lleida.*

Sustainability performance and social embeddedness of the SoldAC' solution – *Edgar Contreras, Mihaela Mirea LOMARTOV*

11:00 – 11:30 Coffee break – 30 min

Session 2 – Market pulse: industry voices

11:30 – 12:30

SOLATOM – *Antonio Famiglietti*

Captur Tower – *Thomas Louagie*

H2B2 Electrolysis Technologies – *Macarena Olias Sanchez*

eChemicles – *Mariia Shabalina*

12:30 – 13.15 Panel session – Bridging Potential and Practice: SoldAC's Way Forward

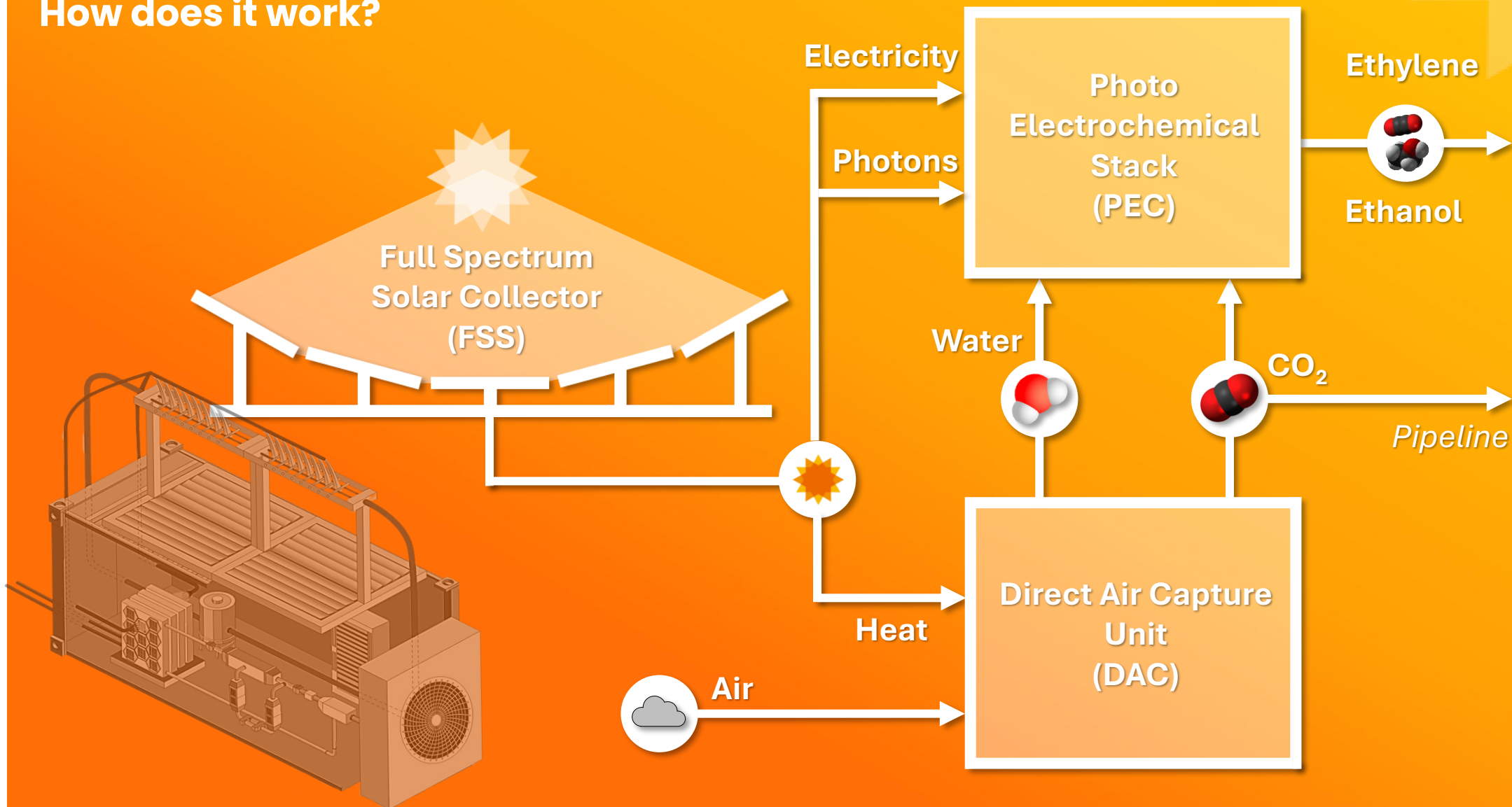
13:15 – 13:30 Main takeaways and wrap-up

13:30 – 14:30 Networking lunch



Our Technology in a Nutshell

How does it work?



SolDAC sub-units on stage – an opportunity for joint or individual exploitation

Unique selling point at System Level



**Energetically
Self-sufficient**



Modular



**Eco-designed
Low CRM content**



Carbon Neutral

C2 products

Keywords (#hashtags)

#fullspectrum solar

#Ultra-lowheatDAC

#DirectAirCapture

#NovelElectrocatalysts

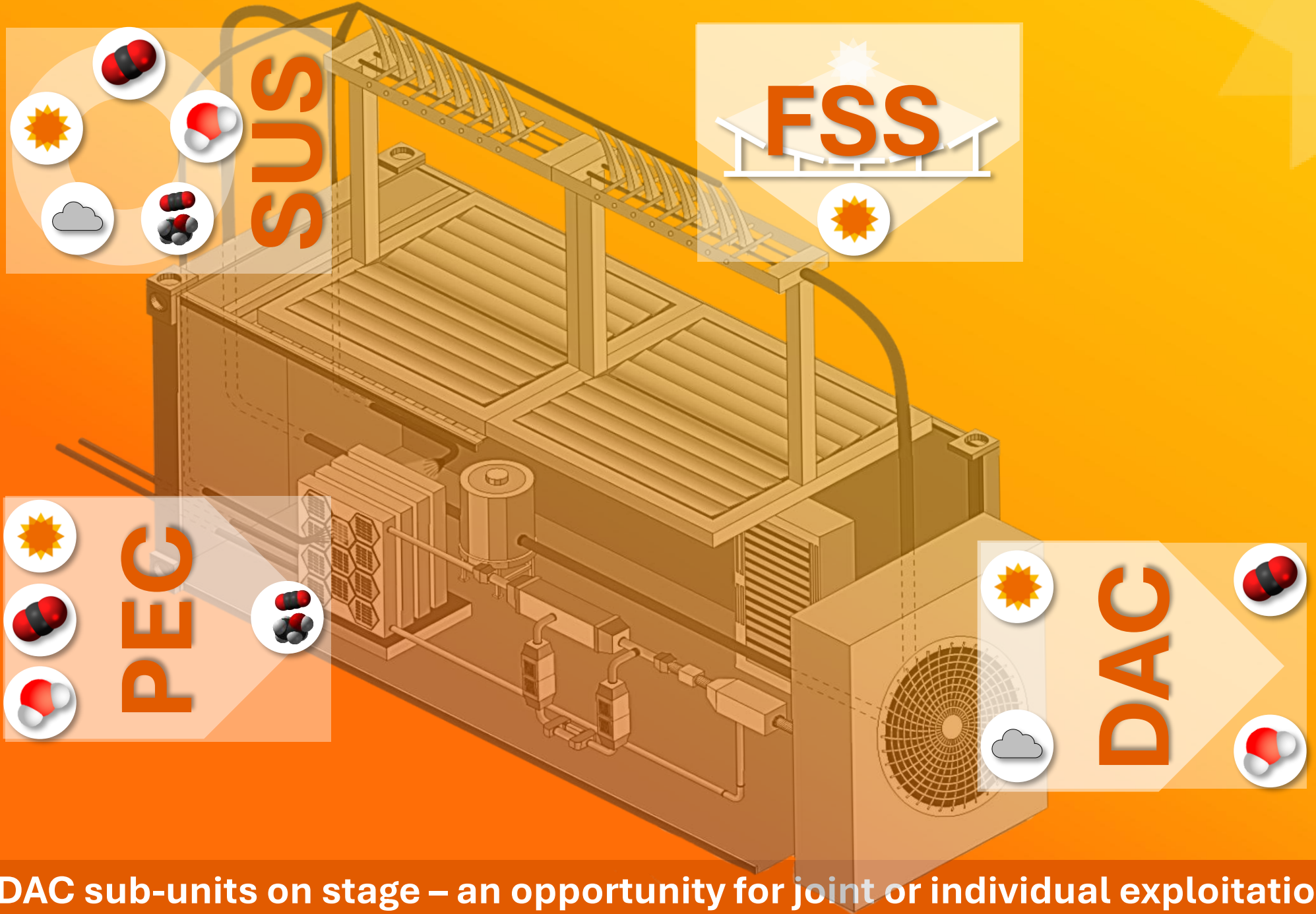
#photoelectrochemistry

#SUNPOWER

SoldAC sub-units on stage – an opportunity for joint or individual exploitation

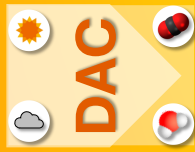
Session 1 – SolDAC's outputs showroom

SolDAC sub-units on stage – an opportunity for joint or individual exploitation



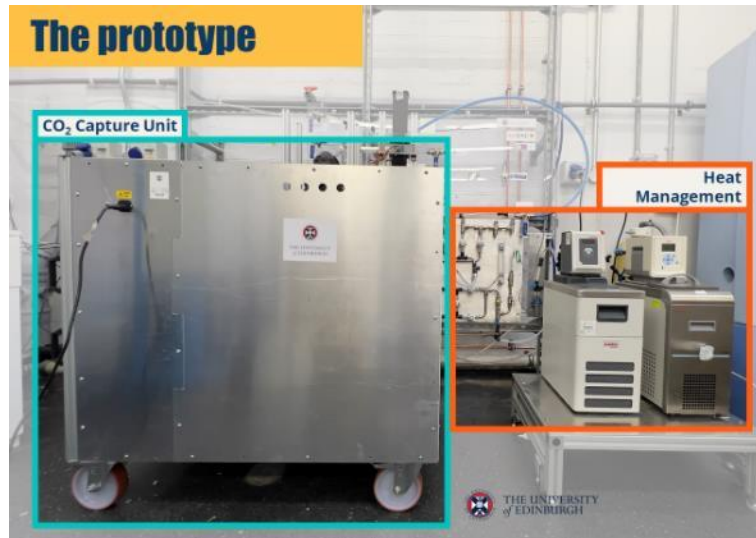
Session 1 – SolDAC's outputs showroom

Direct Air Capture (DAC) Unit

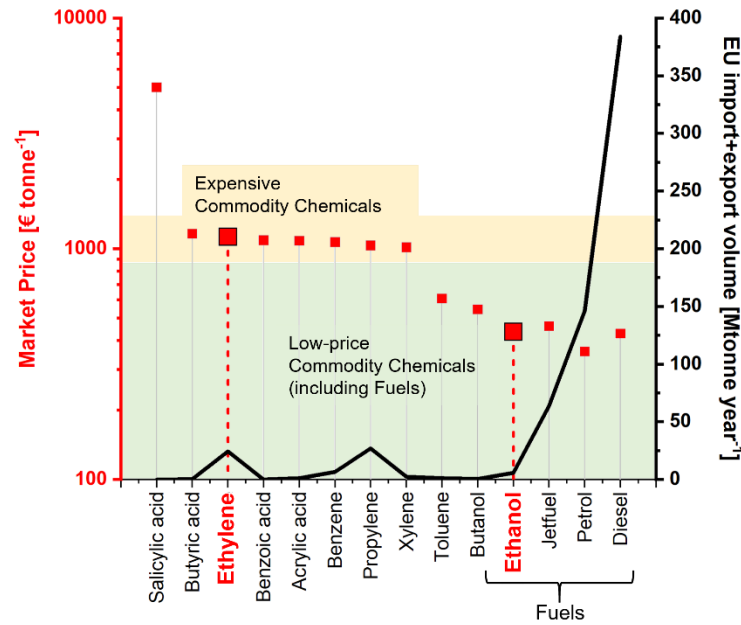
by Giulio Santori (santori@ed.ac.uk – UEDIN)

1. Introduction – Role in SolDAC

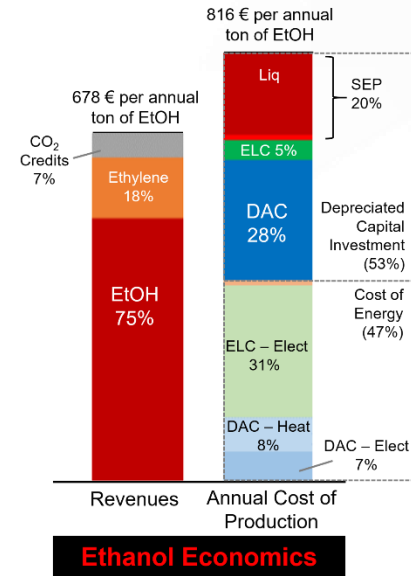
Efficient removal and concentration of atmospheric CO_2 from the pre-dried air stream by using **ultralow-grade heat** (60 °C – 80 °C) and **no vacuum**.



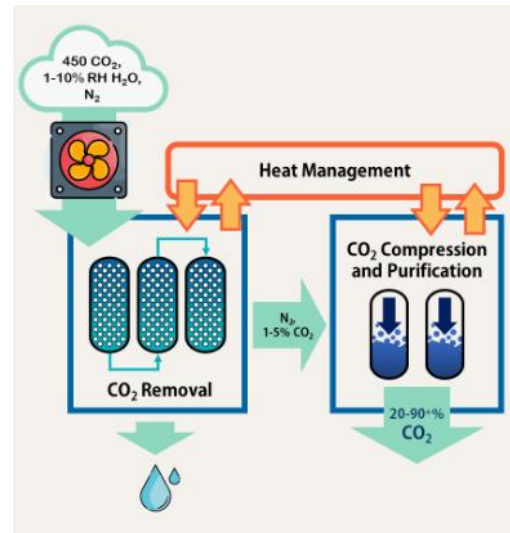
(a)



(b) Annual Cost : Revenues ~1.2



2. System Architecture and Operation

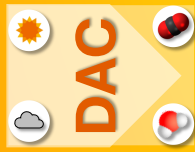


SolDAC sub-units on stage – an opportunity for joint or individual exploitation

Session 1 – SolDAC's outputs showroom

Direct Air Capture (DAC) Unit

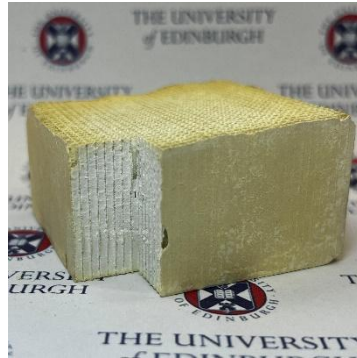
by Giulio Santori (santori@ed.ac.uk – UEDIN)



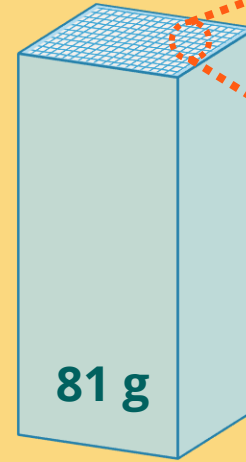
3. Key Research Results: Component Design

• For Removal

- Reduced pressure drop
- Favourable mass transfer



Coated Monolith



Adsorbent
+ binder

81 g

$L = 15 \text{ cm}$, $D = 6 \text{ cm}$

$\Delta P = 102 \text{ Pa}$

• Concentration

- Temperature control
- Desorption boost



Coated Plate Heat Exchangers



6 g
EDA-Y

2 Plates

$39 \text{ cm} \times 15 \text{ cm}$

$\Delta P = 200 \text{ Pa}$

Packed Bed

24.3 g



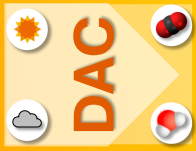
$L = 5.6 \text{ cm}$, $D = 4 \text{ cm}$

$\Delta P = 1.86 \text{ kPa}$



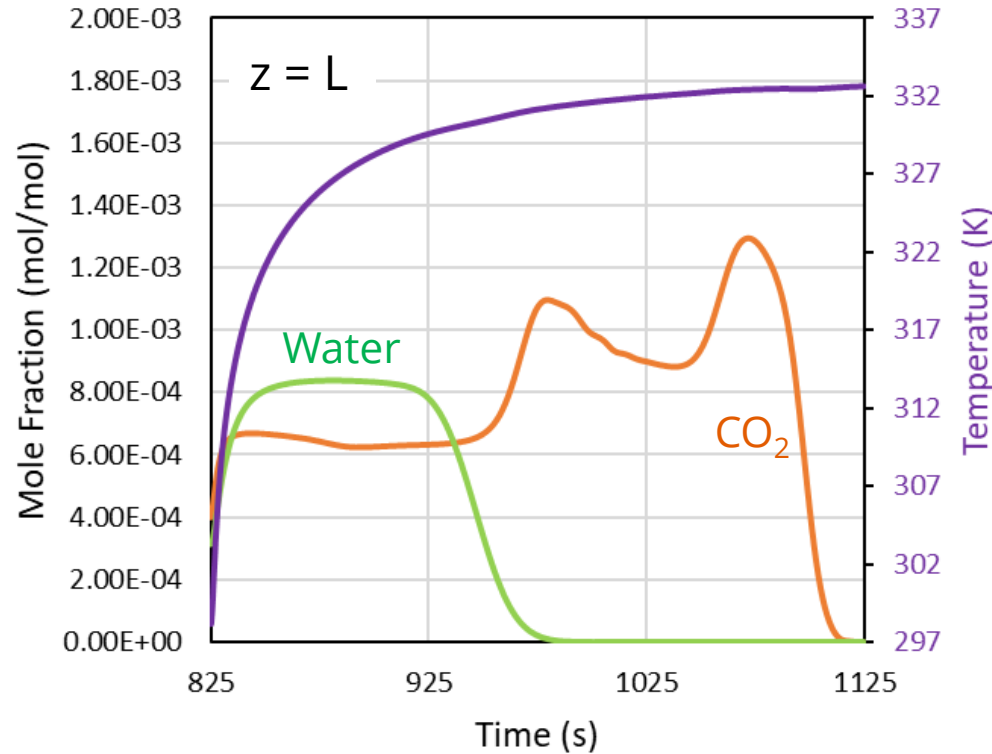
- High capacity
- Control on the concentration front

SolDAC sub-units on stage – an opportunity for joint or individual exploitation

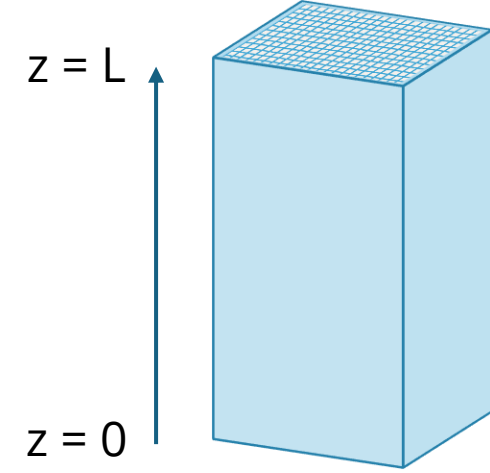


3. Key Research Results: Contactor dynamics

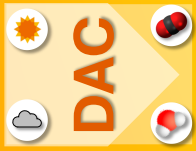
Design predictions for the CO₂ Removal Area



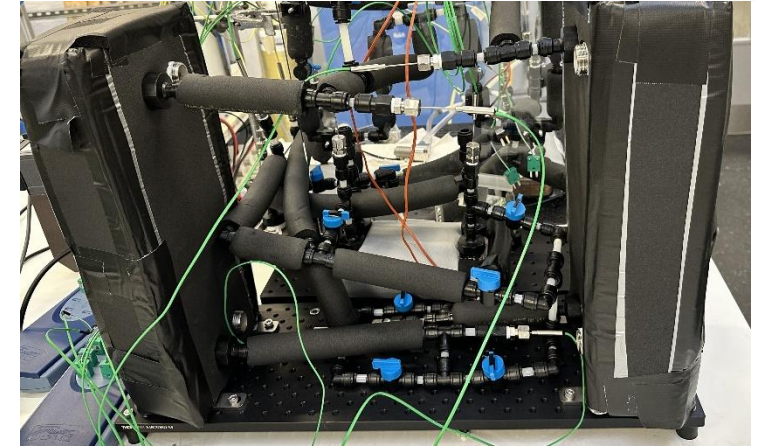
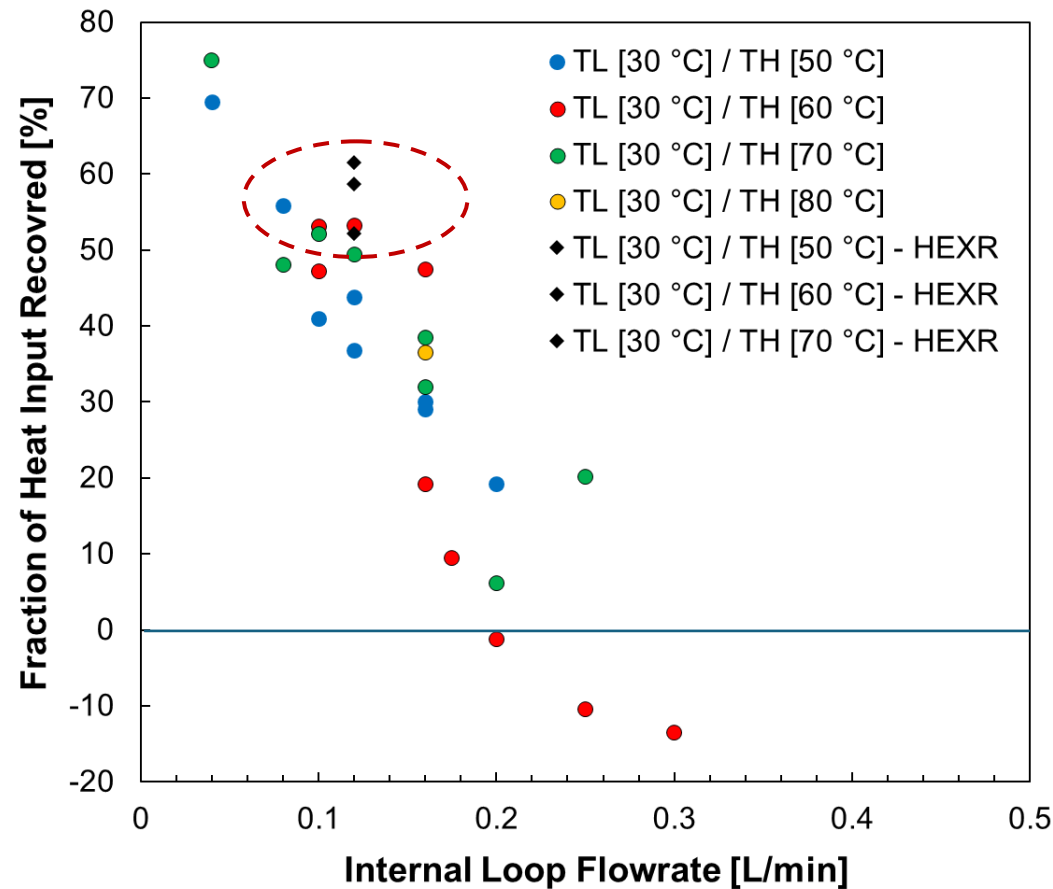
- Purity: 1057 ppm before concentration
- Productivity: 0.41 kg_{CO2} kg⁻¹_{ADS} day⁻¹



- Cycle Time: 1h10
- T_{HOT} : 60 °C
- T_{COLD} : 20 °C
- Primary Energy: 1.45 MJ kg⁻¹_{CO2}
- Elec Energy: 31.09 MJ kg⁻¹_{CO2}



3. Key Research Results: Thermal Wave Heat Recovery

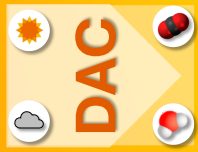


- Up to 61.5% Heat Input is internally recoverable with the Thermal Wave method, more than halving the heat input.

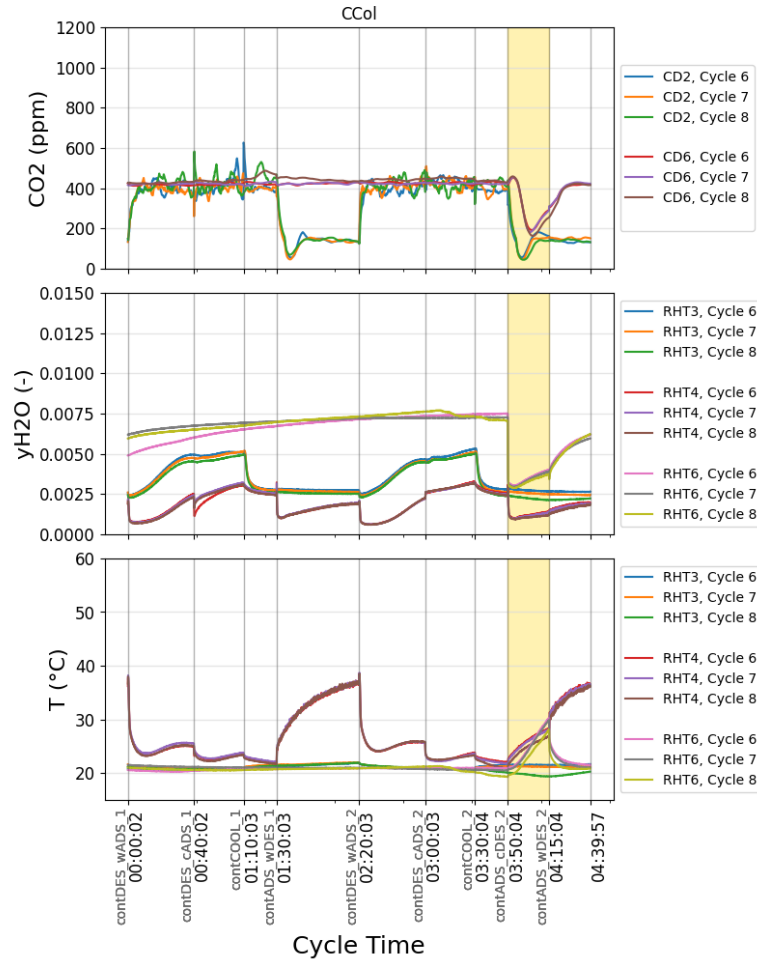
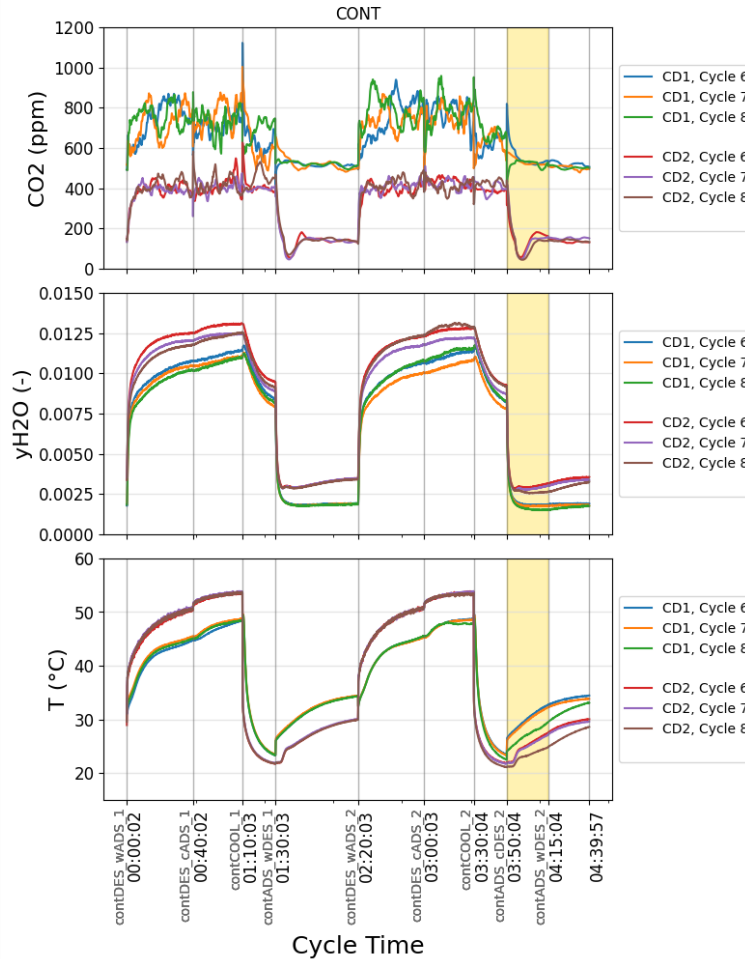
SolDAC sub-units on stage – an opportunity for joint or individual exploitation

Session 1 – SolDAC's outputs showroom

Direct Air Capture (DAC) Unit

by Giulio Santori (santori@ed.ac.uk – UEDIN)4. Challenges & Next Steps: CO₂ Removal AreaTHE UNIVERSITY
of EDINBURGH

IQ0704_5C0L_3C2L1: Loads



- Cycle time: 4h40
- T_{HOT}: 70 °C
- T_{COLD}: 20 °C
- Primary Energy: 15.56 MJ kg⁻¹ CO₂
- Elec Energy: 132.97 MJ kg⁻¹ CO₂

Productivity: 0.43 kg_{CO2} kg⁻¹ ADS day⁻¹

SolDAC sub-units on stage – an opportunity for joint or individual exploitation



5. Key Exploitable Results & Cross-sector Transferability



KER	Description	TRL	Transferability to other sectors	Needs
1	Process for atmospheric CO ₂ removal and concentration	3	Organic chemicals manufacturing, CO ₂ removal in building sector, CO ₂ enrichment users (e.g. Greenhouses, beverage)	Pilot-scale validation

Confidential



THE UNIVERSITY of EDINBURGH



EDINBURGH INNOVATIONS

CONFIDENTIAL

Prior Art Search – EI0000777 / TEC1104592

Process for atmospheric CO₂ removal and concentration

Inventors: Giulio Santori, Stefano Brandani, Paul Wright, Isabella Cavalcante Quaranta, Harpreet Kaur

Report by: Nessim Kichik, Marek Munko

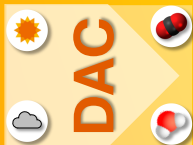
Background and Invention Summary:

The process described in this document is a part of a larger system, which leverages low-grade heat and photo-electrochemical conversion (PEC) to provide an energy-efficient method of capturing CO₂ from air and converting it into ethylene. However, the focus of the disclosed process is solely the removal and concentration of extremely dilute CO₂ from a gas stream (such as a stream of atmospheric air). The process diagram consists of three stages/areas:

1. **Removal area (RA)** – where CO₂ is captured and pre-concentrated;
2. **Compression area (CA)** – where CO₂ purity is built up to the required level;
3. **Heating and cooling area (H&C)** – where heat and cold integration is managed to achieve the target efficiency.

The complete diagram of the process is presented in Figure 1. While all stages are

SolDAC sub-units on stage – an opportunity for joint or individual exploitation



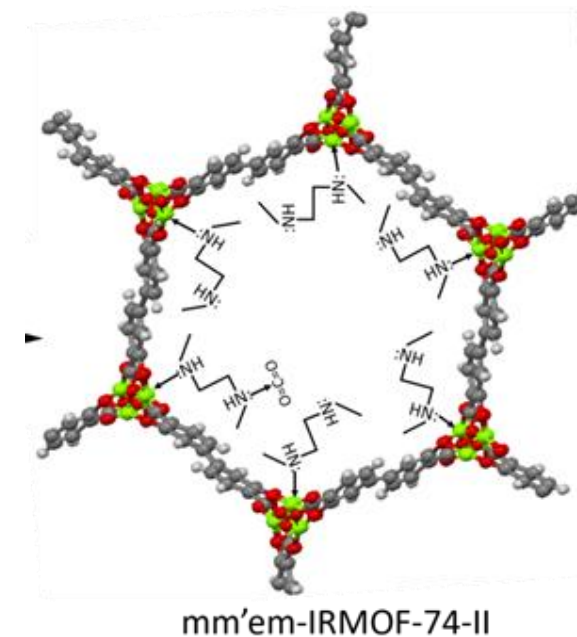
1. Introduction – Role in SolDAC

Prepare and characterize materials for different stages of the DAC unit, including the contactor, concentrator and compression stages. Supply scaled-up materials to UEDIN

2. DAC unit Materials

- Prepare and screen porous solids for best capture performance in different stages
- Identify amines on zeolites as superior to state-of-the-art direct air capture **contactor** materials for low grade heat process, on basis of capacity, kinetics and value
- Identify ultramicroporous MOFs as viable for **concentrator/compressor** beds as fast fully reversible adsorbents with low heat demand.
- Scaled-up amounts (ca. 0.5 kg) supplied to Edinburgh.

Literature



J. Long et al. *J. Am. Chem. Soc.* 2012, 134, 7056

SolDAC sub-units on stage – an opportunity for joint or individual exploitation



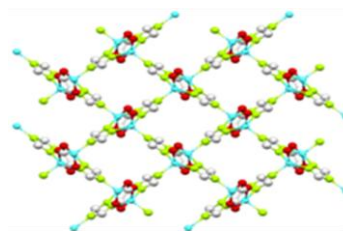
3. Key Research Results : Porous Materials

Mission: **Adsorbents** for direct air capture and concentration of CO₂ in the **presence of moisture** at **moderate temperatures** and **without vacuum** with **short cycle times**

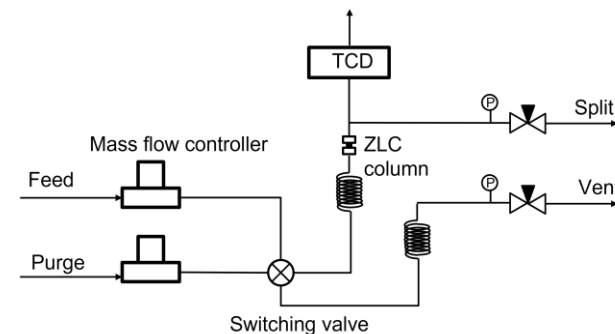
Established Methodology for testing of capacity and kinetics of adsorption and desorption at 400 ppm and in presence of moisture (USTAN, EDIN)

Confirmed that **ultra-microporous MOFs** are suitable for **concentration / compressor** steps (>3% CO₂), even in presence of 5% RH

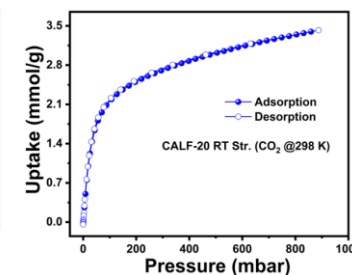
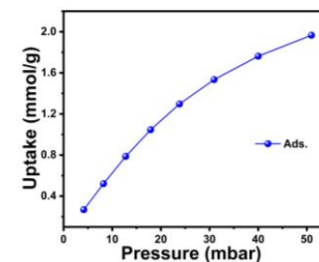
Structure



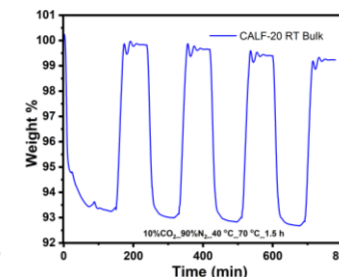
CALF-20 G. Shimizu et al Science, 2021, 336, 1018



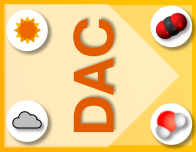
Equilibrium (CO₂ at 298 K)



Kinetics



SoldDAC sub-units on stage – an opportunity for joint or individual exploitation



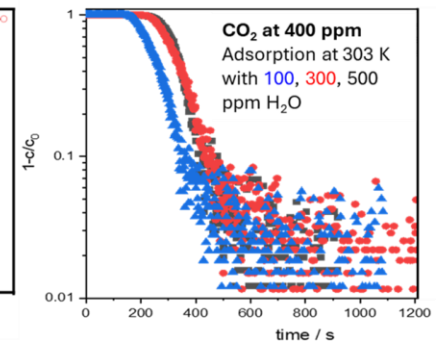
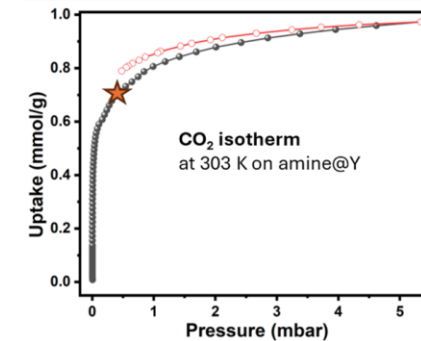
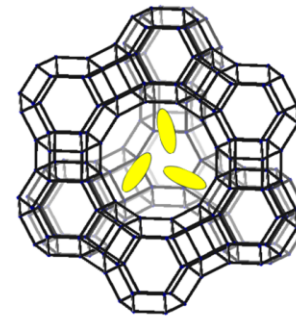
3. Key Research Results: Porous Materials

Mission: **Adsorbents** for direct air capture and concentration of CO₂ in the presence of moisture at low temperatures and without vacuum with short cycle times

Some literature state-of-the-art materials ruled out through kinetic considerations

First demonstration that zeolite-immobilized diamine is effective for 400 ppm CO₂ and in presence of some moisture. Optimised readily available and inexpensive amine@zeolite for kinetics.

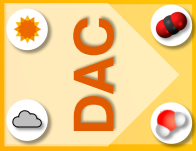
amine@zeolite: structure, adsorption isotherm, kinetics



Routes to **scale-up** and **forming** of porous adsorbents for CO₂ adsorption at different concentrations and gas flows



SoldDAC sub-units on stage – an opportunity for joint or individual exploitation



4. Challenges & Next Steps

Presence of water in gas streams: Optimise configuration for moisture and develop functionalised materials for carbon capture at high RH

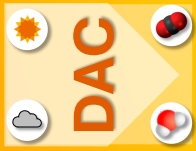
Optimise coating methodology for monoliths and heat exchangers

Optimise amines@MOFs for increased uptake in contactor

5. Key Exploitable Results & Cross-sector Transferability

KER	Description	TRL	Transferability to other sectors	Needs
1	Modified zeolites for DAC	4	Carbon capture over range of CO ₂ partial pressures and process configurations	Development of coating methodology

SolDAC sub-units on stage – an opportunity for joint or individual exploitation



1. Introduction – Role in SolDAC

In carbon capture systems based on sorption processes, water and CO₂ adsorption are competitive .



WATER USUALLY WINS!



To increase the adsorption of CO₂, water needs to be eliminated and hence a water harvesting step is needed.



BUT THERE'S MORE TO IT



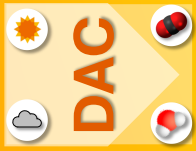
Water harvesting from atmosphere and deep dehumidification are getting more important nowadays for alleviating water stress and scarcity and in industrial sectors such as Li-ion batteries production.

SolDAC sub-units on stage – an opportunity for joint or individual exploitation

Session 1 – SolDAC's outputs showroom

Direct Air Capture Unit

Water Harvester Unit
by Valeria Palomba (CNR)

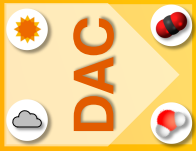


2. System Architecture and Operation

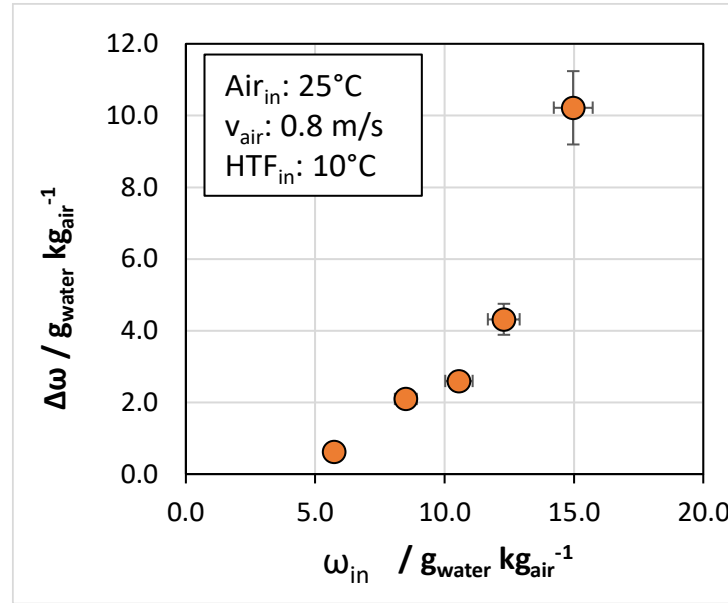


- Almost stand-alone system: only requires connection to a solar collector and a fan for heat dissipation
- 600 W thermal energy required @70-90°C
- 300 W electric energy required
- Fully realised using off-the-shelf commercial components

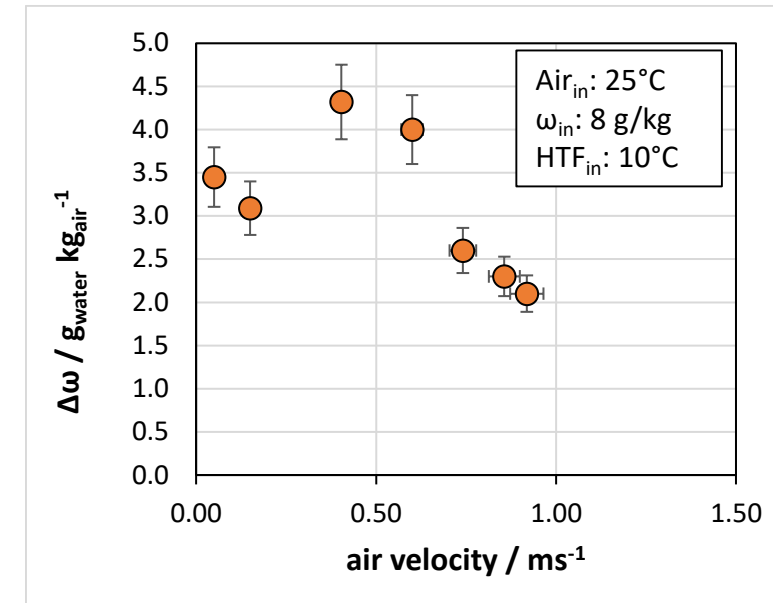
SolDAC sub-units on stage – an opportunity for joint or individual exploitation



3. Key Research Results

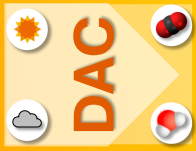


- Proportionality between the adsorption capacity, and the inlet humidity ratio, with a quadratic trend.

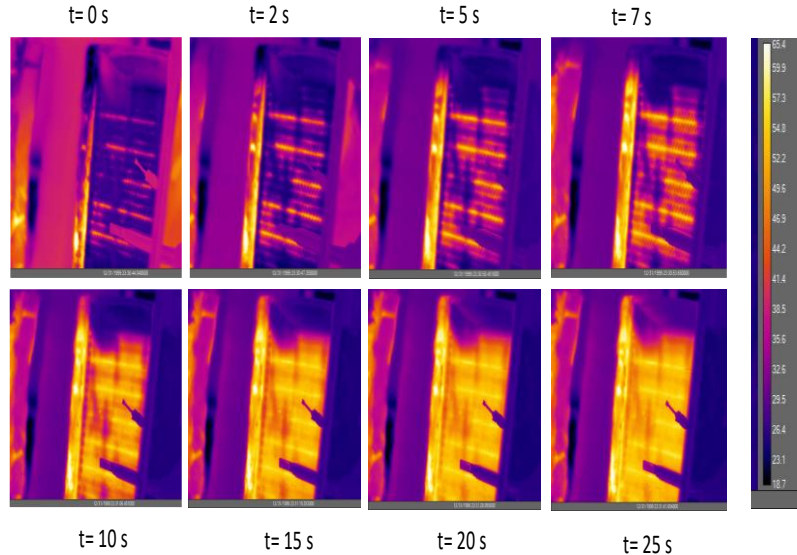


- There is an optimal air velocity – 0.4 to 0.6 m/s
- Comes from the trade-off between heat exchanger characteristics and dynamics of the sorbent.
- The best results are achieved when the ambient temperature is between 10°C and 20°C.

SoldDAC sub-units on stage – an opportunity for joint or individual exploitation

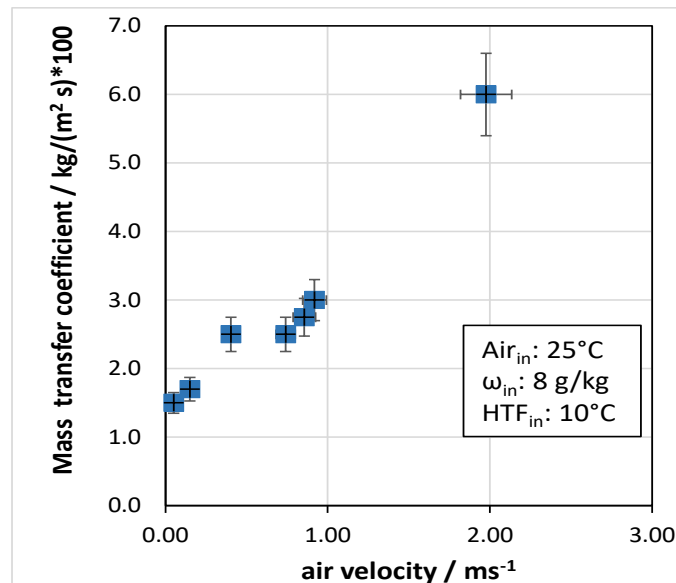


3. Key Research Results



As preliminary test, an entire cycle was recorded with IR camera. Overall heating/cooling requires 30 to 60 s, indicating good efficiency of the selected heat exchanger.

RESULTS ARE +30% COMPARED TO STATE OF ART



Mass transfer is the dominating process in the system → increasing mass transfer will improve the performance of the overall water harvesting device

RESULTS ARE UP +100% COMPARED TO STATE OF ART

SolDAC sub-units on stage – an opportunity for joint or individual exploitation

Session 1 – SolDAC's outputs showroom

Direct Air Capture Unit

Water Harvester Unit
by Valeria Palomba (CNR)

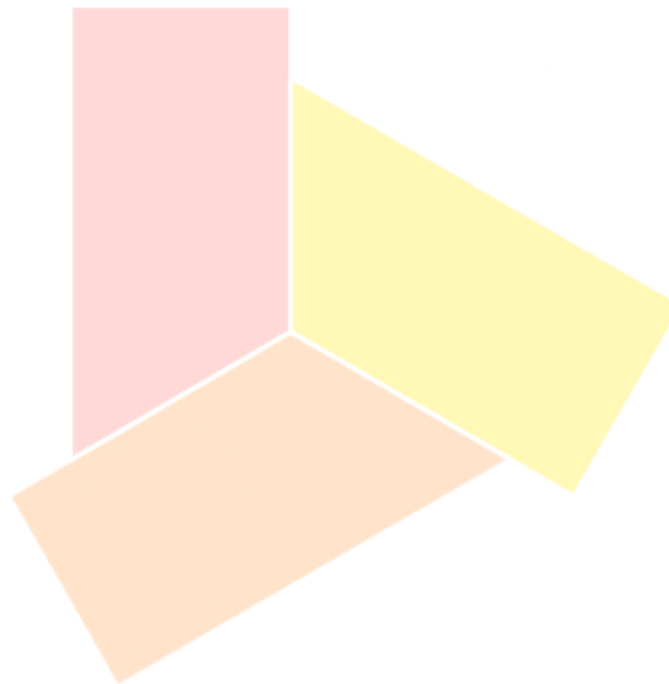
4. Challenges & Next Steps

Pilot scale demonstration

Full demonstration in pilot scale over continuous operation for several weeks.

**Cost-effective design**

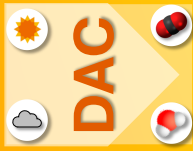
The design should be cost-effective for large scaling up.

**Stand-alone system**

The system should be fully stand-alone and connectable within air-based industrial systems.

Made with Napkin

SoldDAC sub-units on stage – an opportunity for joint or individual exploitation



5. Key Exploitable Results & Cross-sector Transferability

KER	Description	TRL	Transferability to other sectors	Needs
1	Atmospheric water harvester	5	Industrial heat processes, water production in desertic areas	Cost-effective large-scale design, pilot-scale validation

Read our related paper here:

<https://doi.org/10.3390/en18102418>



SolDAC sub-units on stage – an opportunity for joint or individual exploitation

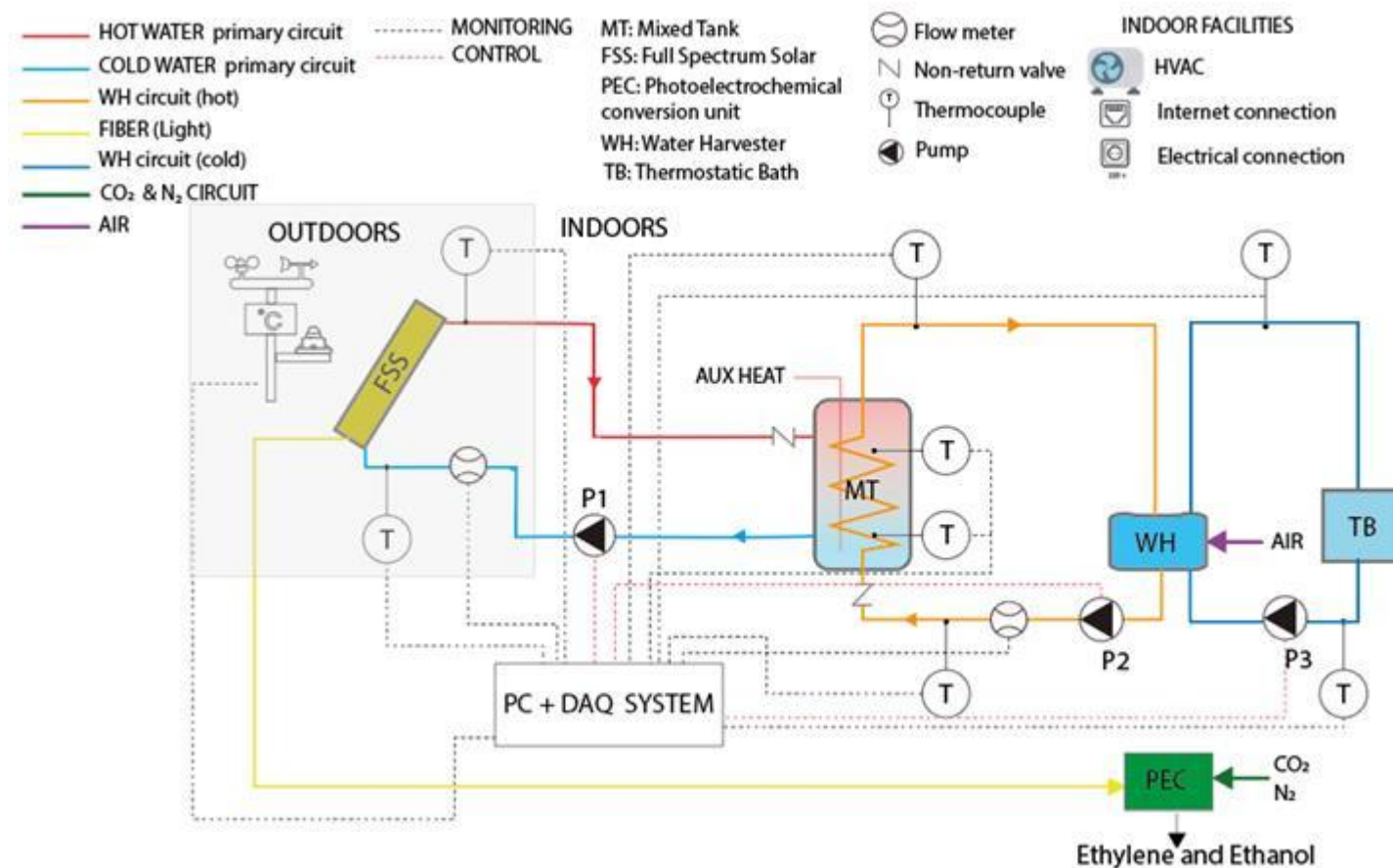


Full Spectrum Solar system

by Daniel Chemisana (UdL)

1. Introduction – Role in SolDAC

The full-spectrum solar system is the energy backbone of SolDAC. Our mission was to develop a compact, hybrid solar unit capable of delivering thermal and electrical energy, and photons — powering the DAC and PEC blocks simultaneously.



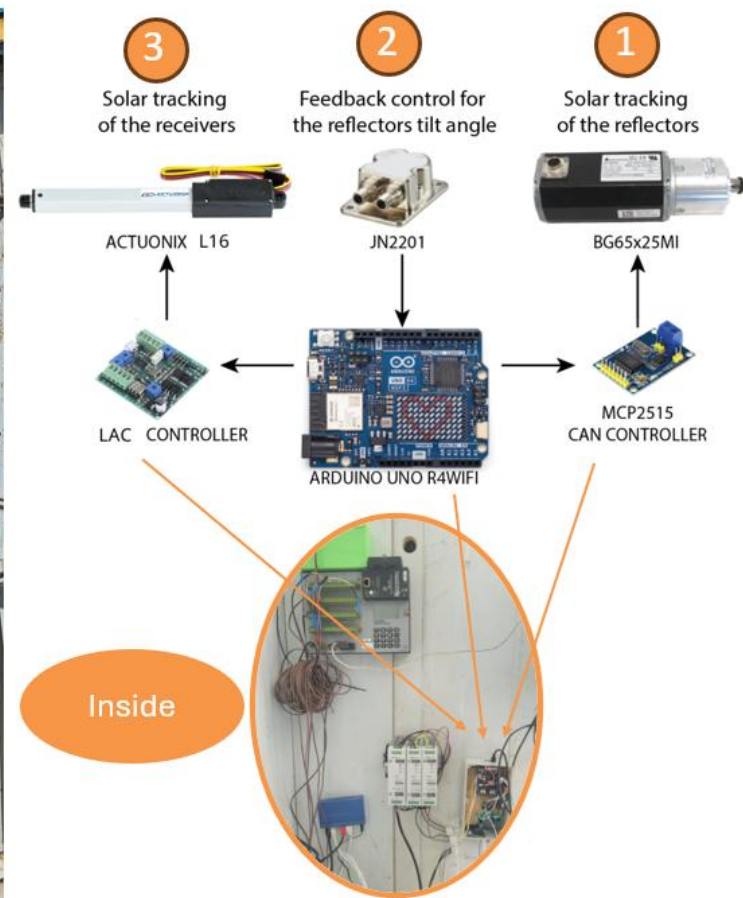
SoldAC sub-units on stage – an opportunity for joint or individual exploitation

Full Spectrum Solar system

by Daniel Chemisana (UdL)



2. System Architecture and Operation



Beam splitting of the incident spectrum depending on the downstream units
 Linear focus to point focus
 Electricity needed for the tracking system (12 V/24 V) and the control system.

SoldAC sub-units on stage – an opportunity for joint or individual exploitation

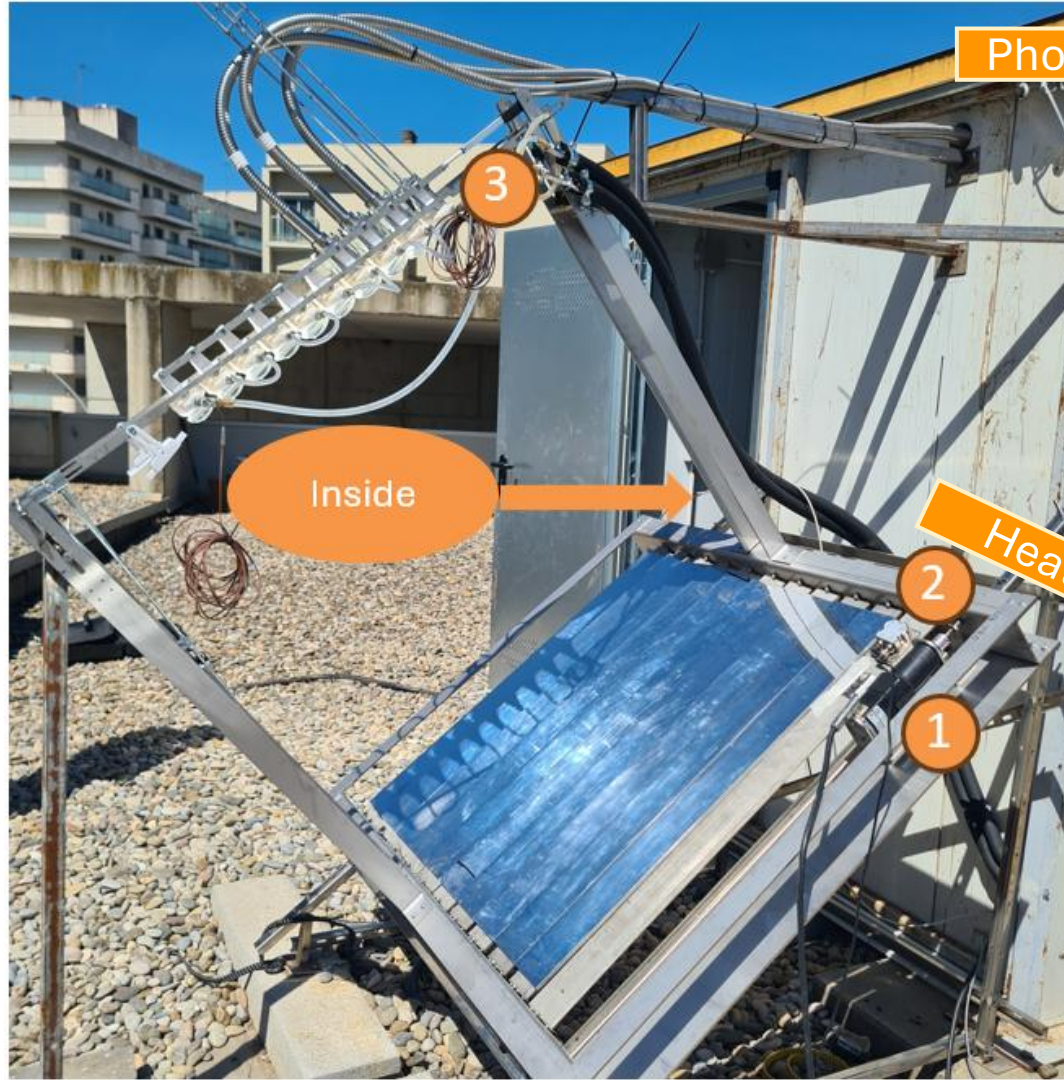
Session 1 – SoldAC's outputs showroom

Full Spectrum Solar system

by Daniel Chemisana (UdL)



2. System Architecture and Operation



GaInP/GaInAs dual-junction solar cells



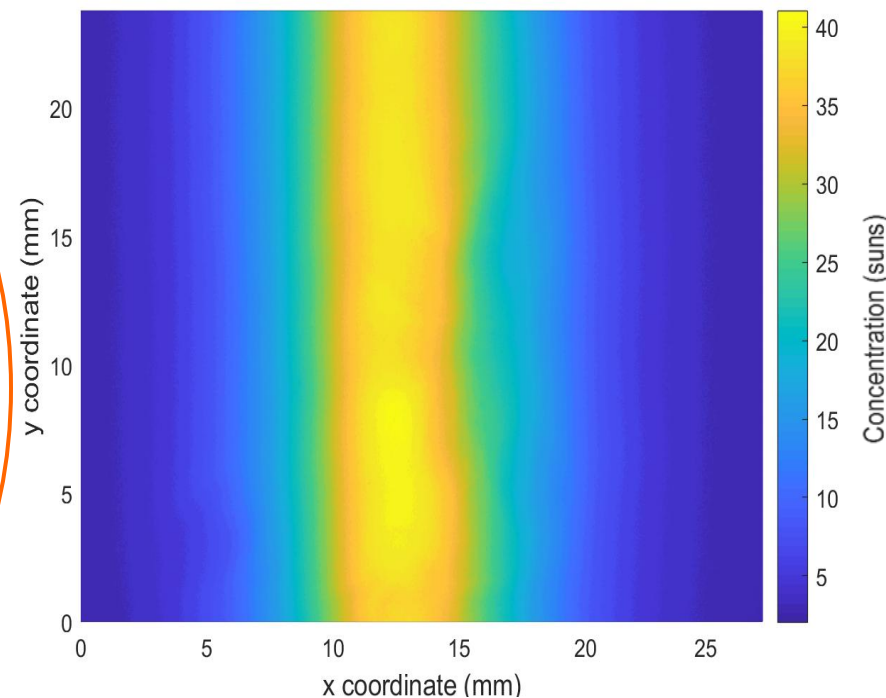
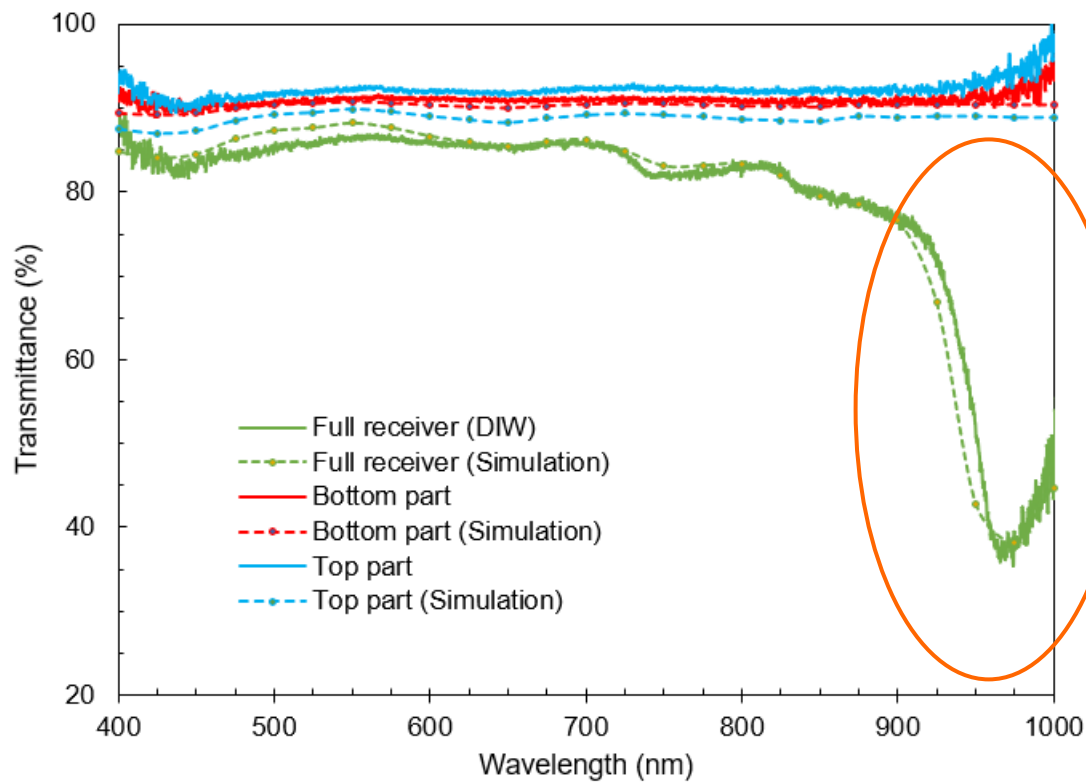
SoldAC sub-units on stage – an opportunity for joint or individual exploitation

Full Spectrum Solar system

by Daniel Chemisana (UdL)



3. Key Research Results

Solar concentration at the focus of the Fresnel concentrator: ~ 41 suns**Solar concentration at the exit of the optical system: ~ 195 suns****SoldAC sub-units on stage – an opportunity for joint or individual exploitation**

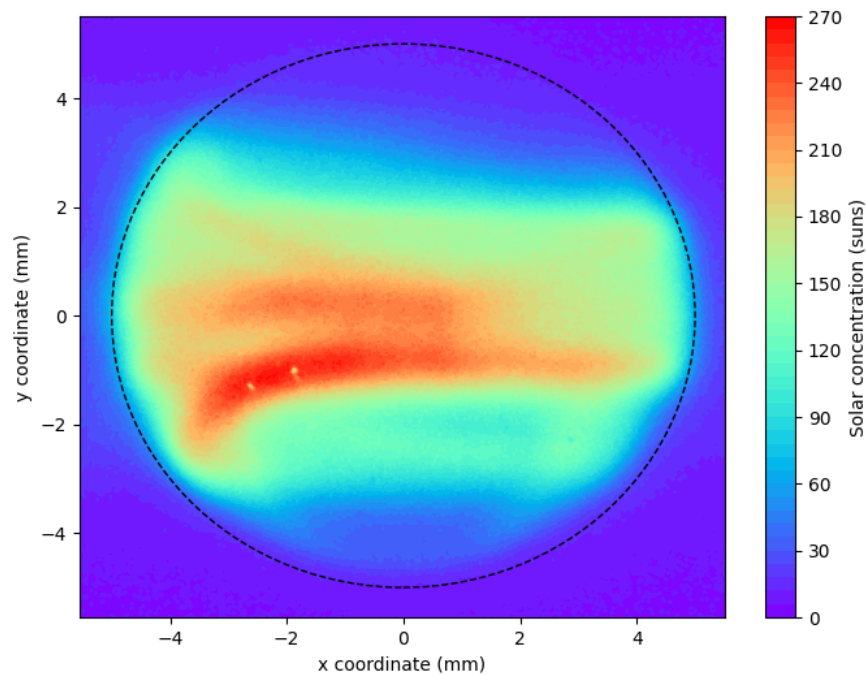
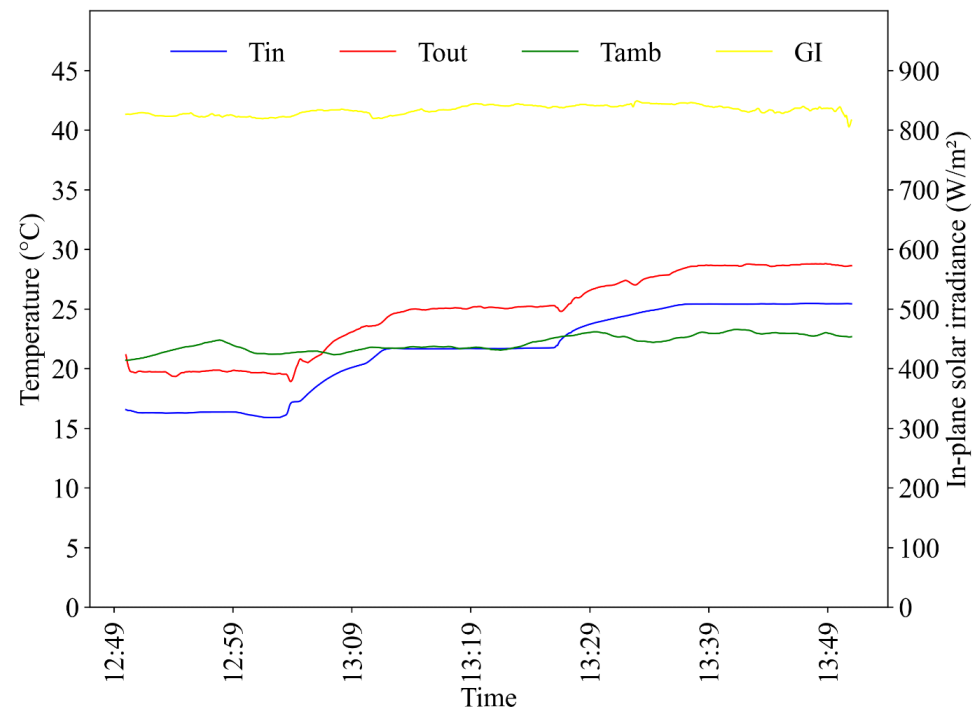
Session 1 – SolDAC's outputs showroom

Full Spectrum Solar system

by Daniel Chemisana (UdL)



3. Key Research Results

*Solar elevation of 34° and an azimuth of 62° Light to electricity efficiency = $\sim 22.5\%$ → $>18\%$ above the state-of-the-artLight to heat efficiency = $\sim 42\%$ → $>35\%$ above the state-of-the-art**Global efficiency $> 60\%$** **→ $>28\%$ above the state-of-the-art****SoldAC sub-units on stage – an opportunity for joint or individual exploitation**

Full Spectrum Solar system

by Daniel Chemisana (UdL)



4. Challenges & Next Steps

Challenges

- High-optical efficiency of system components at a reasonable cost.
- Materials involved in the hybrid receiver.
- Robust control and solar tracking system.
- Cost-effective light-guiding elements

Next Steps

- Re-design of the primary optical concentrator.
- Optimisation of the hybrid receiver and the light-guiding system
- Manufacturing improvement in several FSS components

SolDAC sub-units on stage – an opportunity for joint or individual exploitation

Full Spectrum Solar system

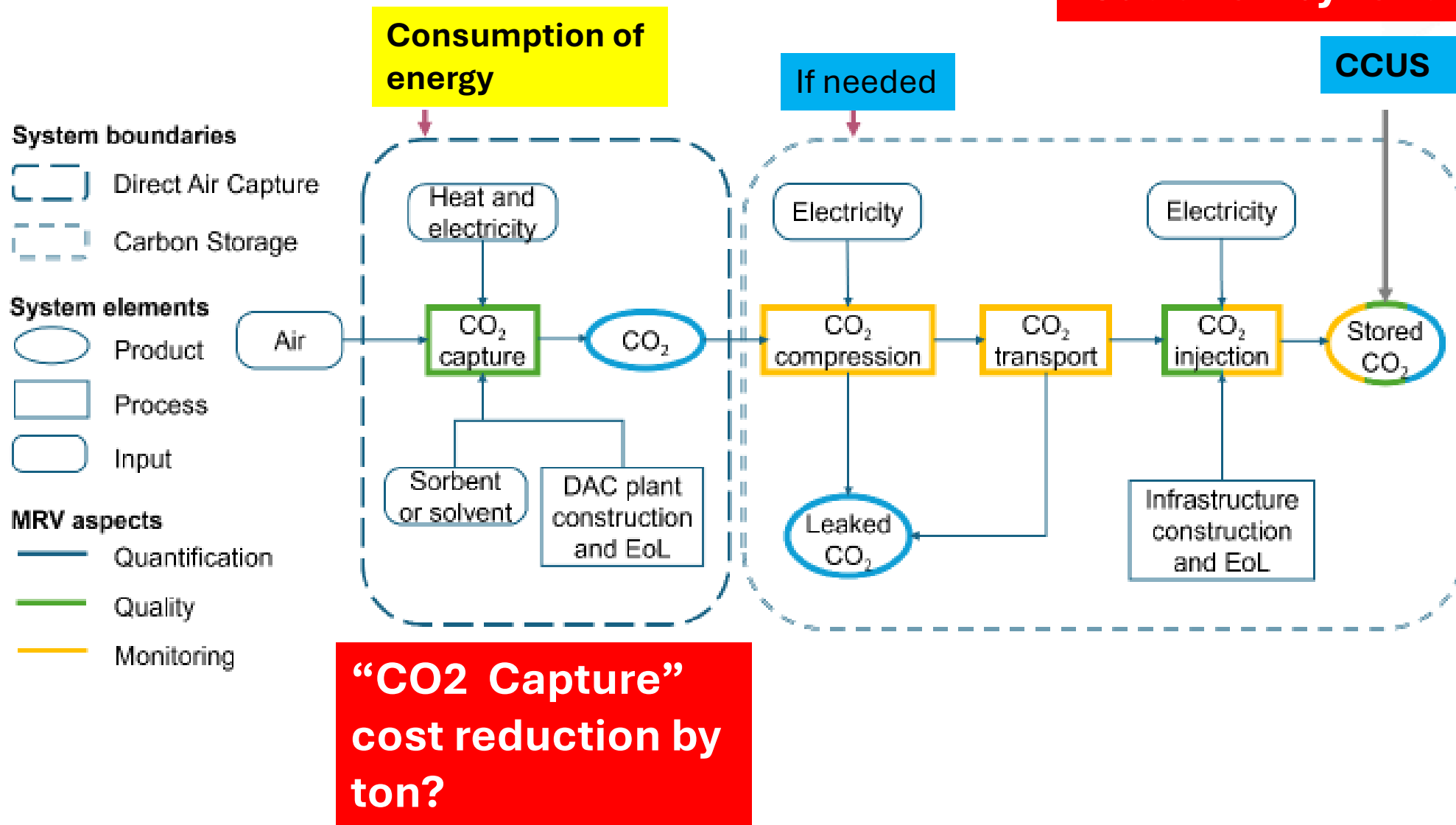
by Daniel Chemisana (UdL)



5. Key Exploitable Results & Cross-sector Transferability

KER	Description	TRL	Transferability to other sectors	Needs
1	Full Spectrum Solar Collector	5	Industrial heat processes, agrivoltaics, energy for buildings	Thermal storage integration, pilot-scale validation

SolDAC sub-units on stage – an opportunity for joint or individual exploitation

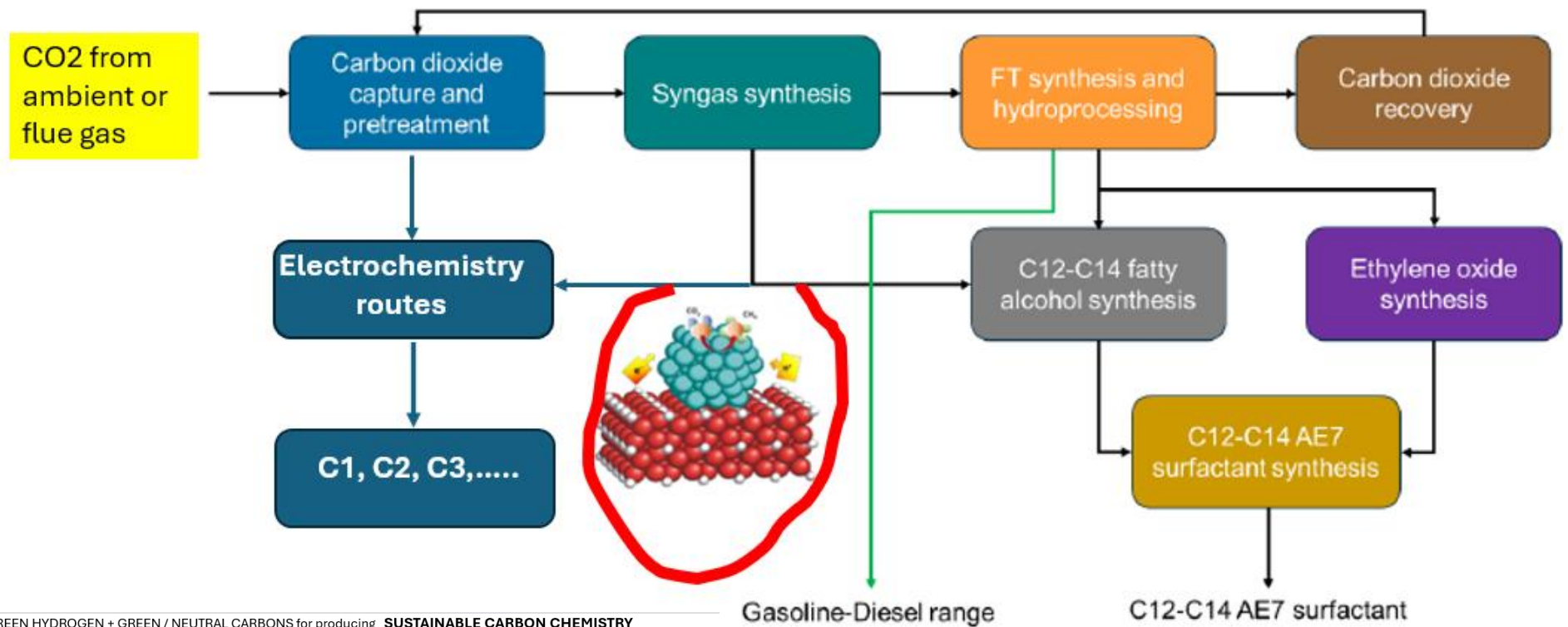
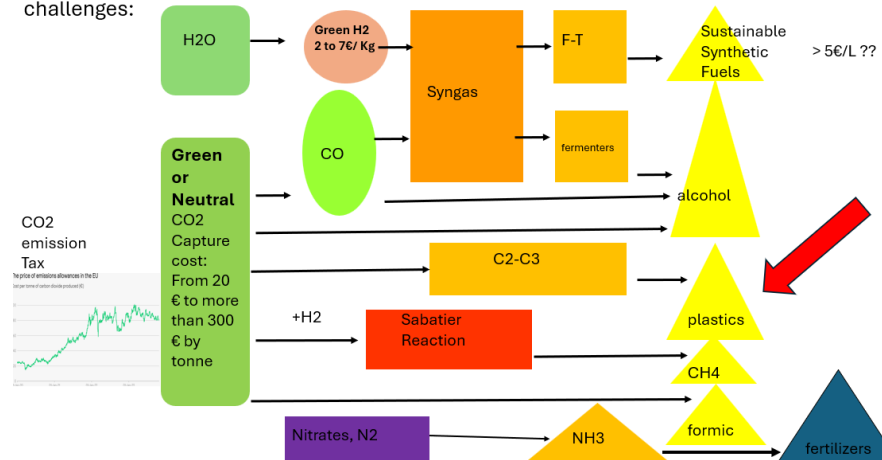


SolDAC sub-units on stage – an opportunity for joint or individual exploitation



GREEN HYDROGEN + GREEN / NEUTRAL CARBONS for producing SUSTAINABLE CARBON CHEMISTRY

challenges:

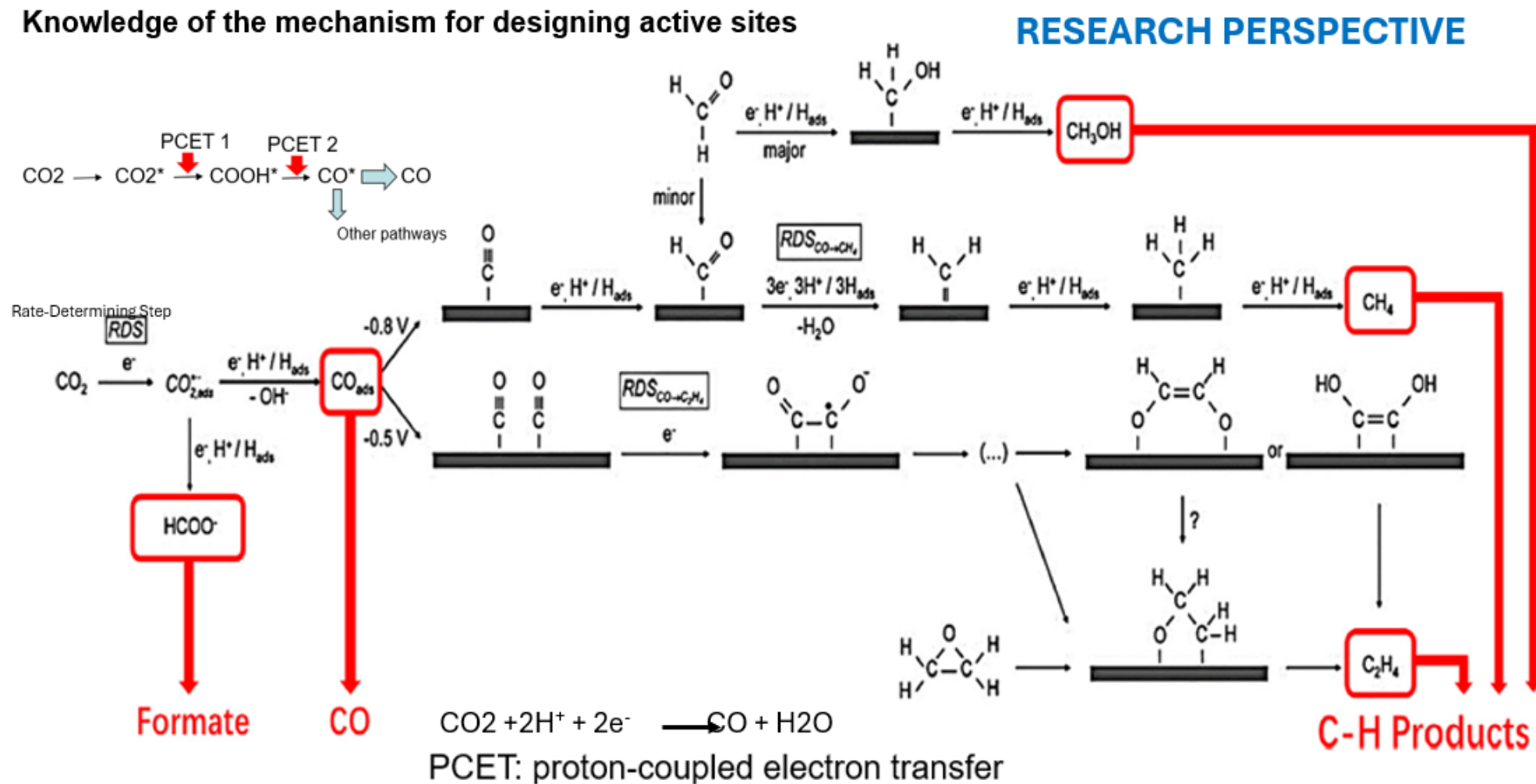


SoldAC sub-units on stage – an opportunity for joint or individual exploitation



Photoelectrochemical Stack

by J.R. Morante (IREC)

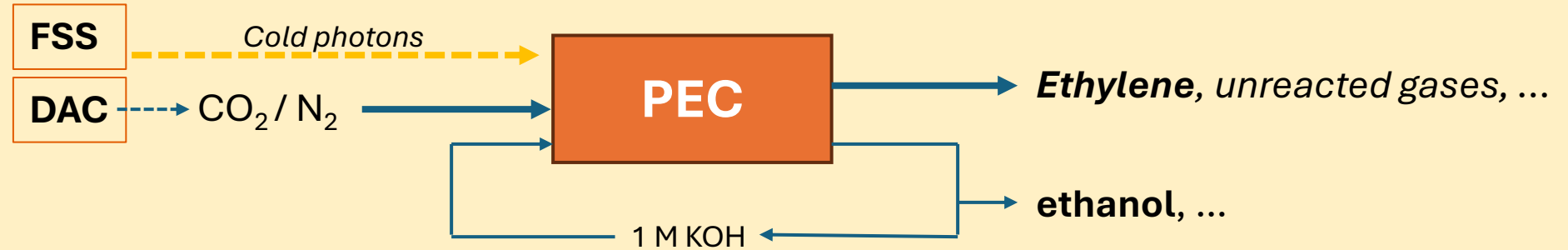


SolDAC sub-units on stage – an opportunity for joint or individual exploitation



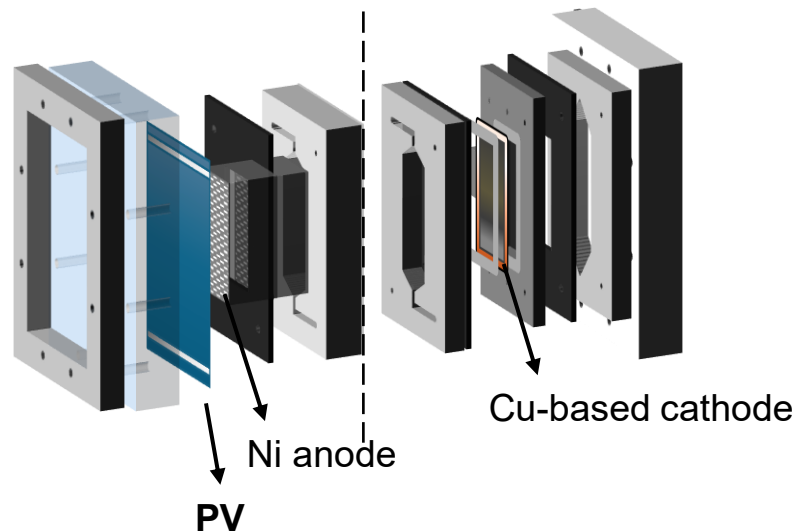
1. Introduction – Role in SolDAC

The **PEC** stack converts the CO_2 captured from DAC into ethylene and ethanol (C_2 products) using photons collected from the FSS



2. System Architecture and Operation

Single-Cell architecture



4-Cells prototype (25 x 4 cm²)



SolDAC sub-units on stage – an opportunity for joint or individual exploitation

Session 1 – SolDAC's outputs showroom

Photoelectrochemical Stack

by J.R. Morante (IREC)

**WHY ethylene?????**

To replace plastic, polymers,....
Introduced in the current lifestyle.

Cost is essential!!!

**1 ton of plastic = 20.000 bottles
is admissible duplicate cost?**

- Around 413,8 Mt of plastics are produced in the world (2023)
- Europe produced 54 million tons of plastic.
- About 2800€/ton More that 150.000 Millions of revenue.
- CAGR >3,5% (compound annual growth rate)
- (PP, PE), PVC and PS/EPS.

- ☐ Each ton of fabricated fossil plastic is producing about 2,5t of CO₂.
- ☐ The recycling is producing about 2,7t of CO₂
- ☐ The GHG impact of European plastics production is estimated at 140Mt CO₂ eq. +95 Mt for the recycling circuit.
- ☐ Approximately almost 4% % of the total CO₂ eq. in Europe 27+UK (3593Mt)
- ☐ For comparison, the whole emission of CO₂ in Spain is 217Mt of CO₂ eq.

Decarbonization opportunities in the plastics industry

SolDAC sub-units on stage – an opportunity for joint or individual exploitation

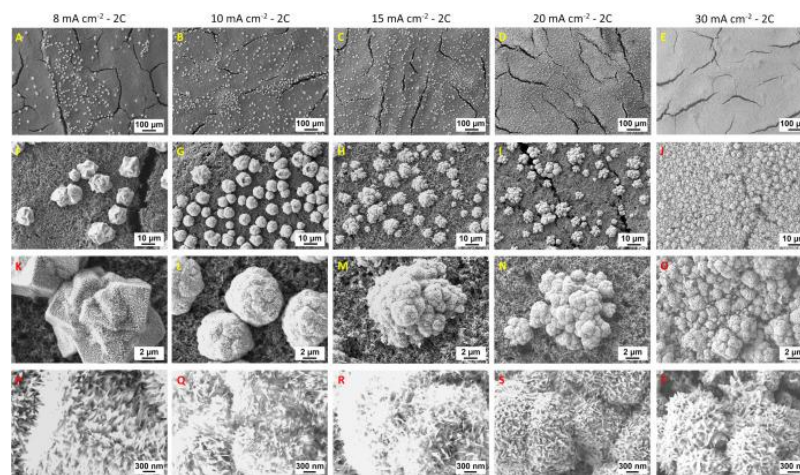


3. Key Research Results

Development of materials for cathodes - Optimization of electrodeposition parameters for Cu-based catalysts for electrochemical CO₂ reduction

IREC - UEDIN

Low cost and abundant materials for the catalyst



- *Systematic study of electrodeposition of Cu-based catalysts*
- *Scalable methodology for electrodeposition of Cu-based catalysts on commercial GDEs*
- *Catalytic **material saving of 50%**, decrease in **75% electrodeposition time***

Mater. Today Sustain. 31, **2025**, 101116. <https://doi.org/10.1016/j.mtsust.2025.101116>

SoldAC sub-units on stage – an opportunity for joint or individual exploitation

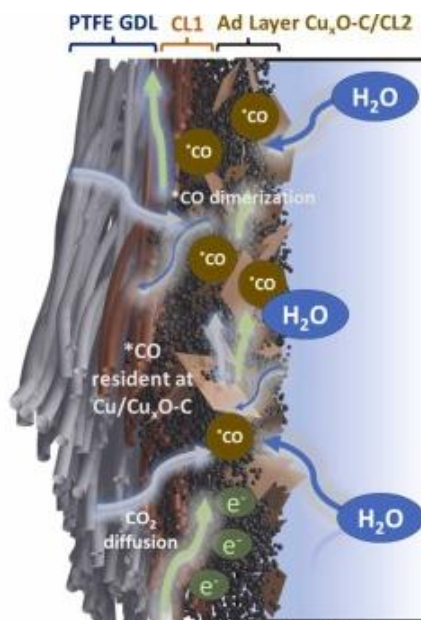


3. Key Research Results

Optimization the architecture of GDEs for Cu-based catalysts for electrochemical CO₂ reduction

IREC - UEDIN

Implementation of now expensive, effective and feasible technology



- Optimization of PTFE/Cu-based GDEs architectures in cathodes for electrochemical CO₂ reduction
- **Faradaic efficiencies to ethylene $\geq 70\%$. Combined C₂₊ products FE $\geq 90\%$ at industrially relevant current density of $250 \text{ mA} \cdot \text{cm}^{-2}$**
- Stability tested 25 hours

Appl. Catal. B-Environ 371, **2025**, 125276. <https://doi.org/10.1016/j.apcatb.2025.125276>

SoldAC sub-units on stage – an opportunity for joint or individual exploitation



4. Challenges & Next Steps

Scalability

Demonstrations with higher total surface area ($> 1000 \text{ cm}^2$) and higher productivity

Stability

Demonstrate stability for $> 1000 \text{ h}$
@ $250 \text{ mA} \cdot \text{cm}^{-2}$

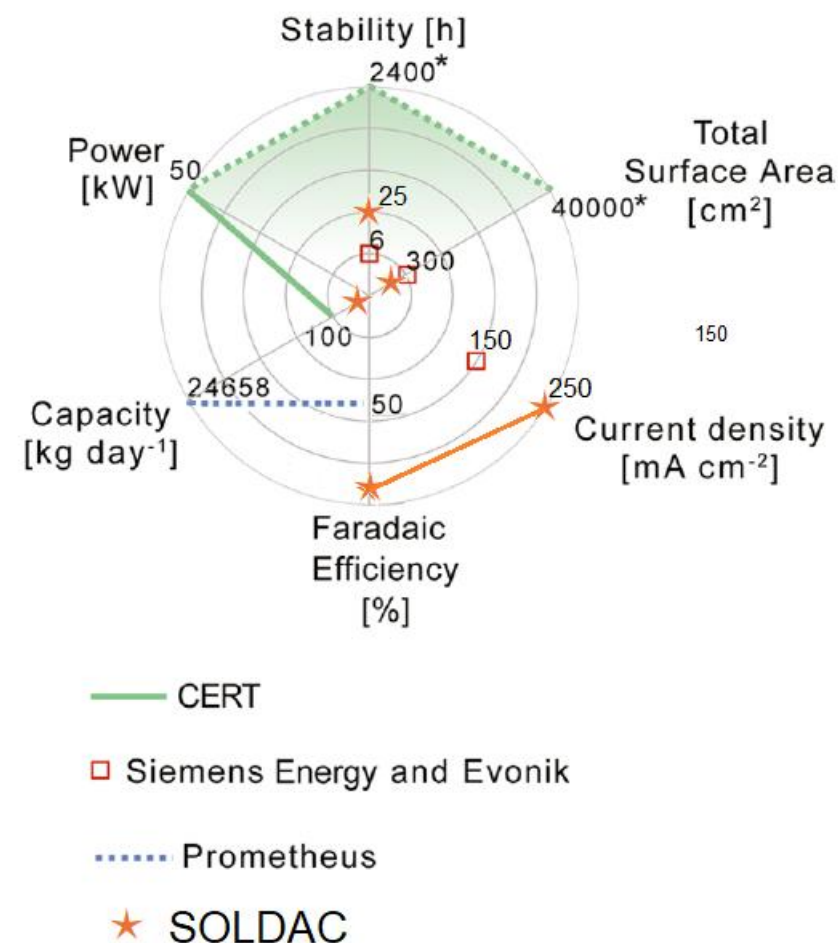
Energy Efficiency

Optimize photoanodes for increased energy conversion efficiency

Systems Integration

Improve performance under streams with CO_2 concentration lower than 50%

Reported performance metrics for C_2 products



Adapted from:

ACS Energy Lett. 9, 2025, 4293-4305.

<https://doi.org/10.1021/acsenenergylett.4c00955>

SolDAC sub-units on stage – an opportunity for joint or individual exploitation

Photoelectrochemical Stack

by J.R. Morante (IREC)



5. Key Exploitable Results & Cross-sector Transferability

KER	Description	TRL	Transferability to other sectors	Needs
1	New catalysts and GDE formulations for CO ₂ reduction to C ₂ products	5	Electrochemical reactors and Fuel cells	Optimized selectivity and charge transfer
2	Innovative photoelectrode architectures for water oxidation	5	Electrolyzers, Green Hydrogen, CCUS	Energy optimization, Solar energy harvesting
3	Device for photoelectrochemical conversion of CO ₂	5	Electrolyzers, Green Hydrogen, CCUS	Solar energy harvesting; CO ₂ conversion

SolDAC sub-units on stage – an opportunity for joint or individual exploitation

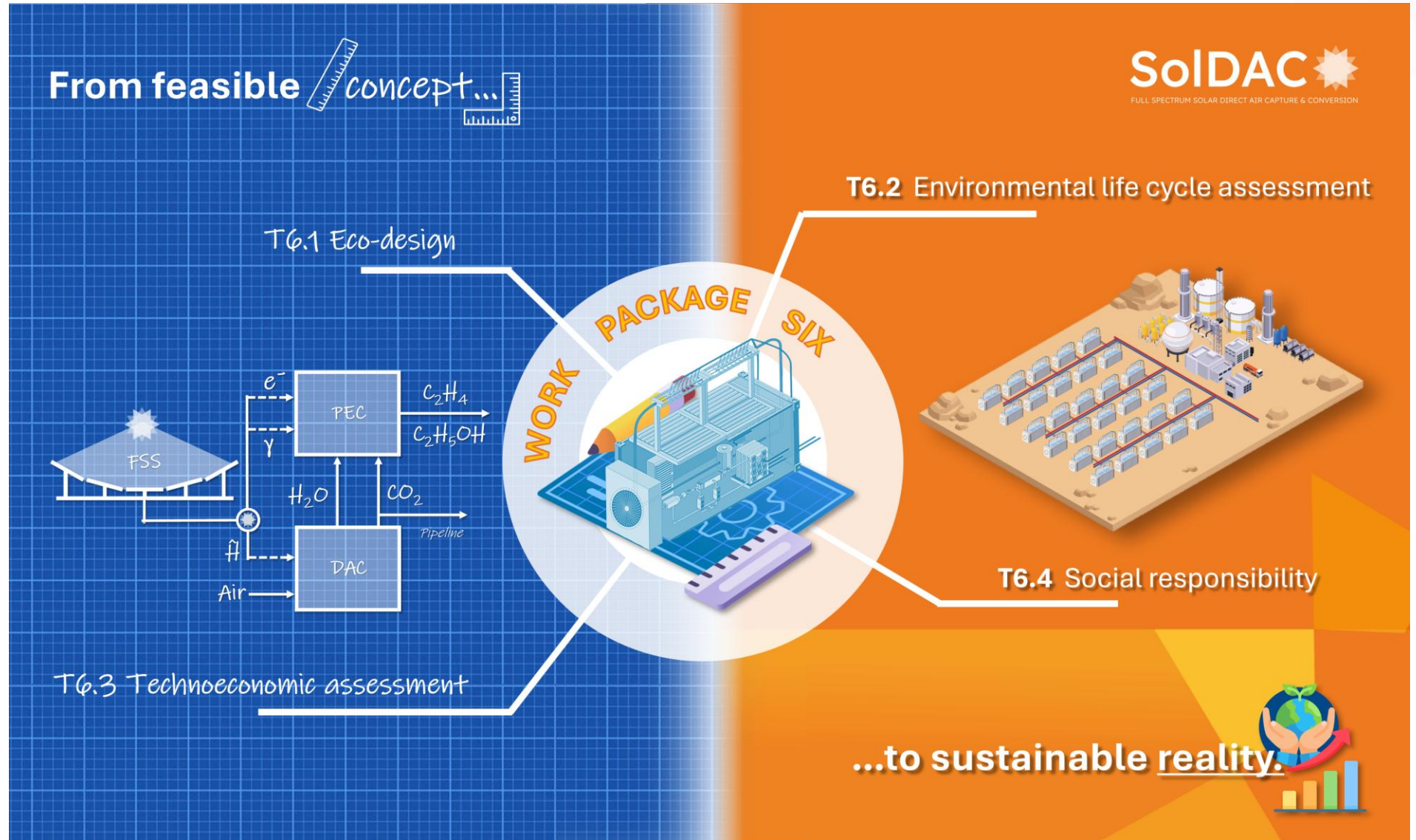
Session 1 – SolDAC's outputs showroom

Sustainability validation

by Edgar Contreras & Mihaela Mirea (LOM)



SolDAC's sustainability strategy



SolDAC sub-units on stage – an opportunity for joint or individual exploitation

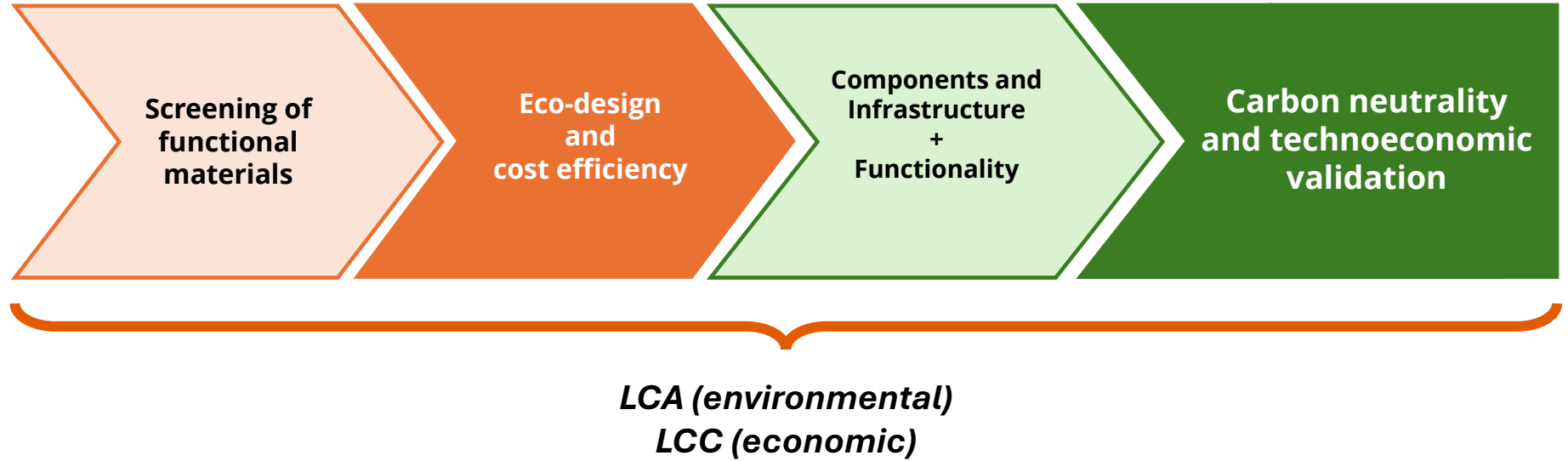
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Sustainability validation

by Edgar Contreras & Mihaela Mirea (LOM)

SoldAC's sustainability strategy



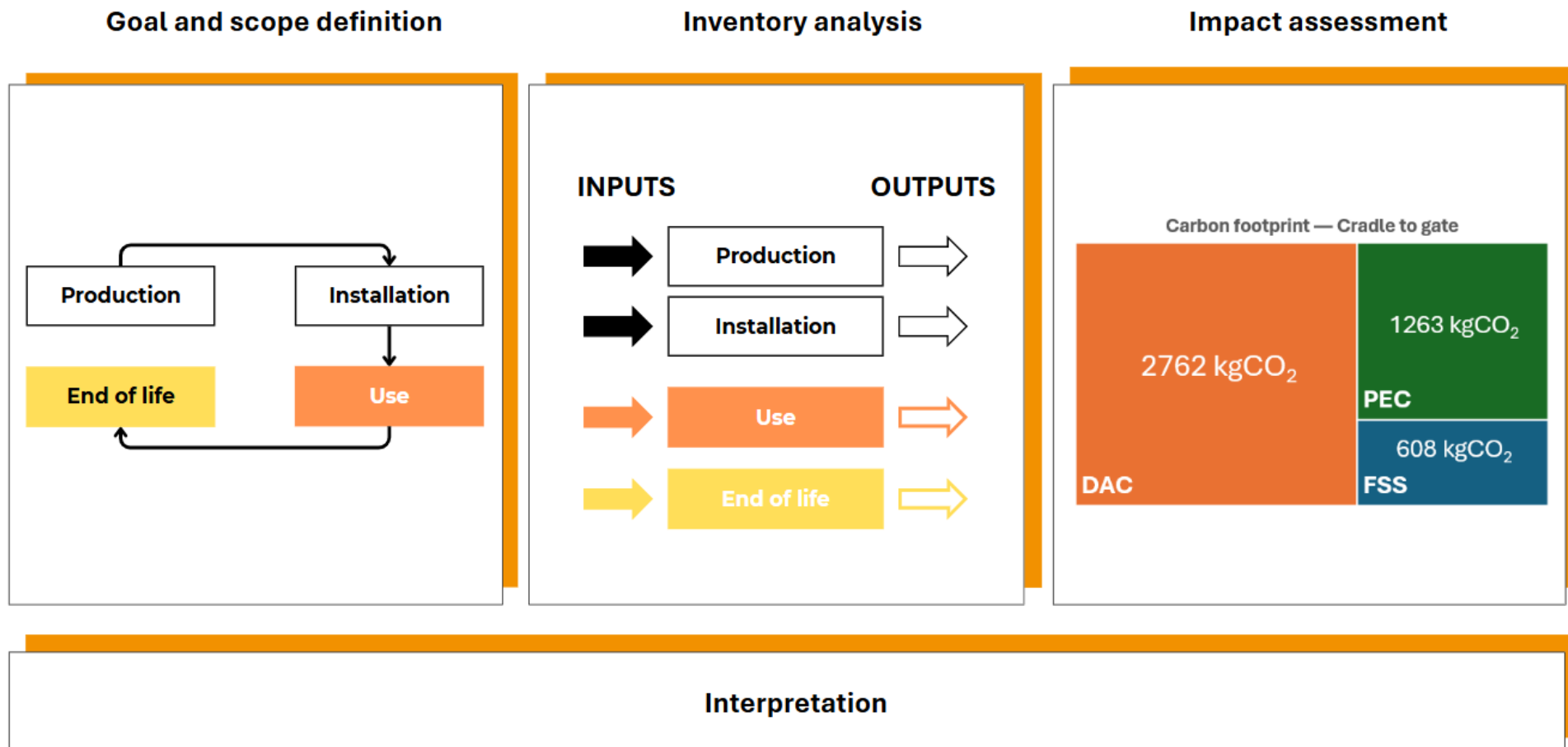
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Sustainability validation

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SoldAC's sustainability strategy



Life Cycle Assessment and Life Cycle Costing standardized framework

SoldAC sub-units on stage – an opportunity for joint or individual exploitation

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Key findings

T6.1 Eco-design recommendations

Recommendations

FSS

Selection of material composition for **light-guiding optical element**.
 Selection of material composition for **absorptive liquid element**.

DAC

Selection of composition for **water harvester active material**.
Minimisation of organic precursors use in the synthesis of nanoporous materials.
 Optimisation of **critical precursors for zeolite functionalisation**.
Restriction of PGMs in nanoporous materials synthesis.

PEC

Selection of **cathode catalyst** composition.
 Selection of **anode material** composition.
 Selection of **cathode substrate** composition.
 Selection of **cell technology for photoanode**

T6.2 Preliminary technoeconomic assessment

Development of
assessment tool

Sensitivity verification

Demonstrator
commissioning costs

SolDAC sub-units on stage – an opportunity for joint or individual exploitation

Session 1 – SolDAC's outputs showroom



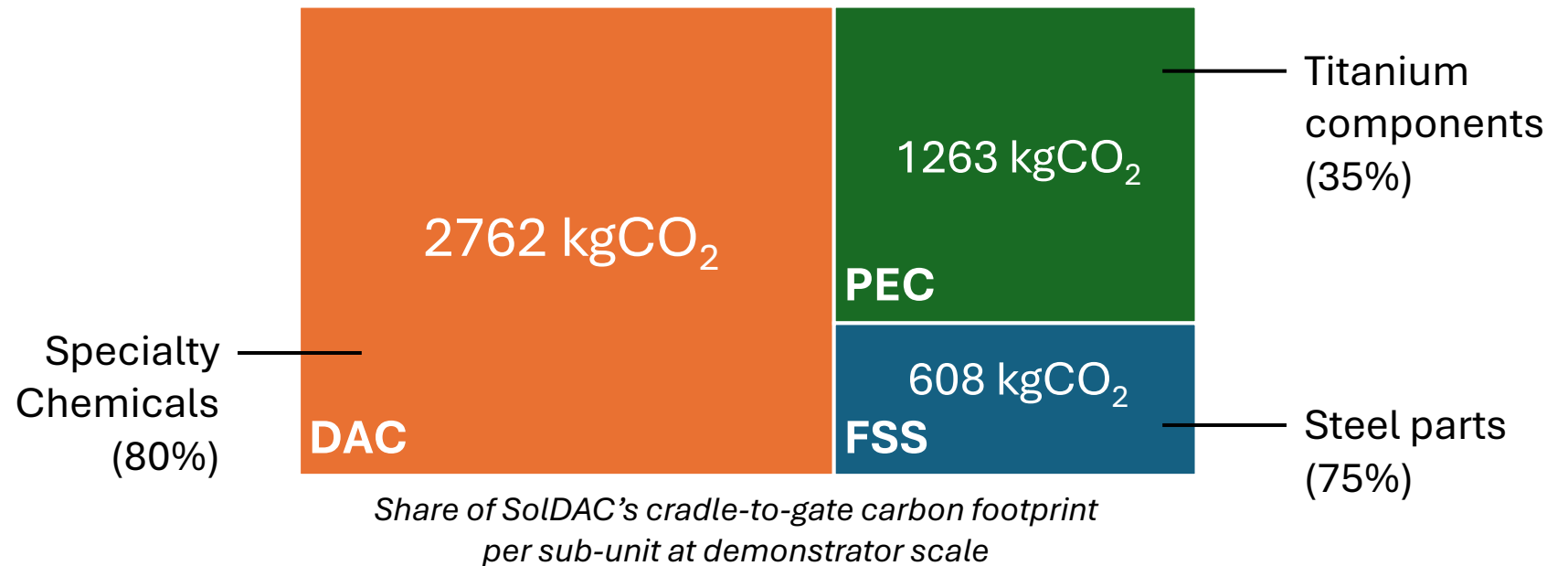
Sustainability validation

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Key findings

T6.3 Environmental validation

Total footprint	4 633 kgCO ₂ eq	Lifetime	20 years
Carbon removal rate	16.4 kgCO ₂ /day		
Ethylene production	1 kg ethylene/day		
Break-even point	10 months; 282 kg of ethylene		



SolDAC sub-units on stage – an opportunity for joint or individual exploitation



1. Why social acceptance matters – from technology to transformation?

- *Innovation alone is insufficient – true adoption relies on **public trust, societal alignment, and perceived legitimacy**.*
- *Industrial uptake depends on an enabling environment: **market demand, political support, and community endorsement**.*
- ***SoldAC** serves as a model case, embedding stakeholder perspectives from the earliest stages of development.*
- *Aligning societal and technical readiness **reduces risk, builds confidence, and accelerates deployment**.*



Social acceptance triangle. Adapted from Wüstenhagen et al (2007)

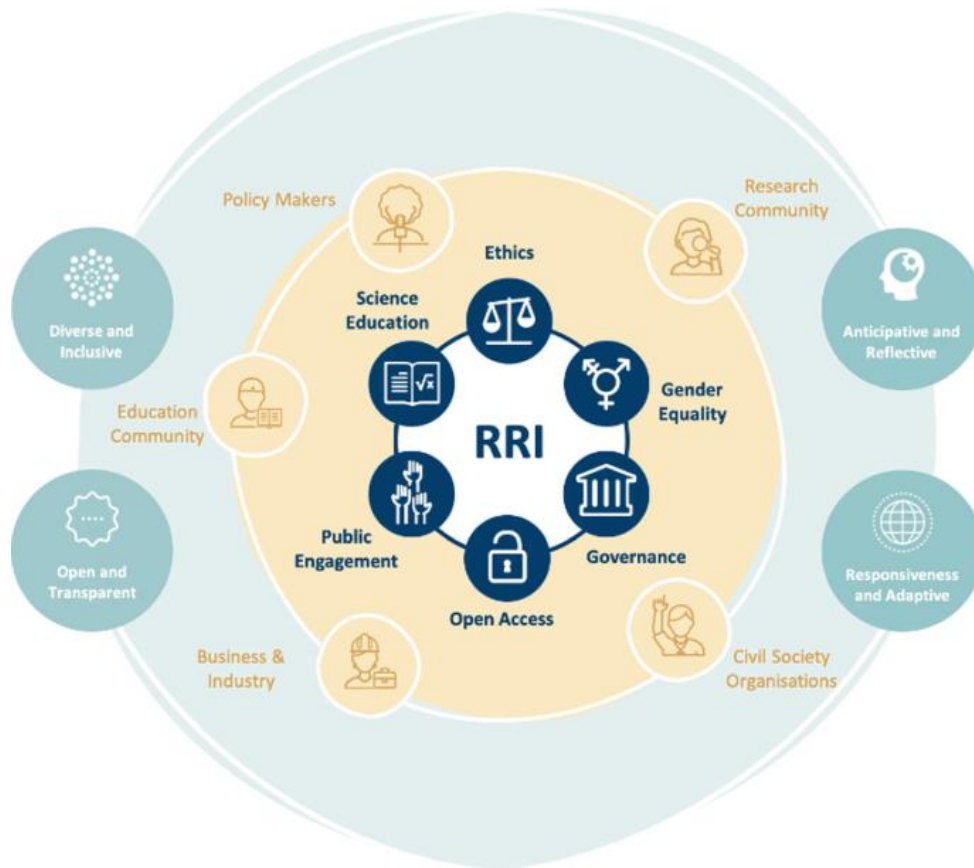
SoldAC sub-units on stage – an opportunity for joint or individual exploitation

Social embeddedness

by Mihaela Mirea (LOM)



2. Responsible Research & Innovation (RRI) – embedding responsibility into research from day one



RRI dimensions, stakeholders y values










- SolDAC integrates six RRI dimensions: **Ethics, Public Engagement, Open Access, Gender Equality, Governance, and Science Education.**
- The approach is guided by four core values: **inclusion, anticipation, reflexivity, and responsiveness.**
- Internal RRI workshops across partners to map **societal expectations, stakeholder needs, and ethical risks.**
- RRI is treated not as compliance but as a **co-creative process to shape technology in line with societal values.**

SoldAC sub-units on stage – an opportunity for joint or individual exploitation



3. Societal Embeddedness Level (SEL) Framework – bridging technical progress and societal readiness

- SEL complements TRL addressing **non-technical conditions for successful innovation**.
- It includes four dimensions: **Environmental Impact, Stakeholder Involvement, Policy & Regulation, Market and Financial Viability**.
- SoldAC applied the SEL framework from early TRL stages (2–3) to **guide socially responsive design**.
- Unlike traditional “readiness” models, SEL ensures that **innovations are embedded into real-world systems and expectations**.

Dimension	SEL 1 (Exploration)	SEL 2 (Development)	SEL 3 (Demonstration)	SEL 4 (Deployment)	Current SEL
Environmental Impact	✓	✓			2-3
Stakeholder Involvement	✓	✓ Engaging workshops	✓ Public acceptance		2-3
Policy & Regulations	✓	✓ Policy engagement			1-2
Market & Finance	✓	✓ Business case			2-3
Legend: ✓ Completed  In progress / not fully achieved  Not initiated					

SoldAC sub-units on stage – an opportunity for joint or individual exploitation



4. SoldAC's stakeholder communication strategy – how to build support



Transparency - Open and honest communication about both successes and limitations.

- Reports include **LCA results**, **energy demand data**, and **prototype constraints**.
- Communicates **uncertainties** around DAC efficiency and materials sustainability from early stages.
- Transparency builds **technical credibility** and **public trust**, especially when sharing incomplete or evolving results.



Bidirectional Dialogue -Two-way engagement that incorporates feedback and enables co-creation.

- **Stakeholder Board** formed at Month 4 and engaged throughout R&D.
- **Co-creation workshops** used to surface stakeholder values and concerns.
- **Digital forms and feedback channels** (e.g., website inputs, online polls) ensure accessibility across geographies.
- Outcomes influence research direction and communication framing.

SoldAC sub-units on stage – an opportunity for joint or individual exploitation







Social embeddedness

by Mihaela Mirea (LOM)

5. Industry Takeaways from SoldAC – societal embeddedness: from risk to competitive advantage

Audience-specific narratives

Open and honest communication about both successes and limitations.

Audience	Narrative Focus
 Industry	“SoldAC is a modular decarbonisation solution that integrates into existing processes.”
 Policymakers	“SoldAC enables progress on the EU Green Deal through circular CO ₂ utilisation.”
 Academia	“SoldAC contributes to CCU and PEC research, data-sharing, and responsible innovation.”
 Civil Society	“SoldAC offers greener production, local job potential, and supports climate justice.”

SoldAC sub-units on stage – an opportunity for joint or individual exploitation

Panel session – Bridging Potential and Practice: SoldAC's Way Forward



Antonio Famiglietti



Thomas Louagie



Macarena Olías Sánchez



Mariia Shabalina



POWER

CAPTURE

CONVERT

IGNITING THE FUTURE

SoldAC

*meets
the*

MARKET



Industrial Workshop | 25th June 2025 - Barcelona (Spain)



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