SUSTAINABLE PLACES

CO2NDOR

COmbined suN-Driven Oxidation and CO_2 Reduction for renewable energy storage

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006839

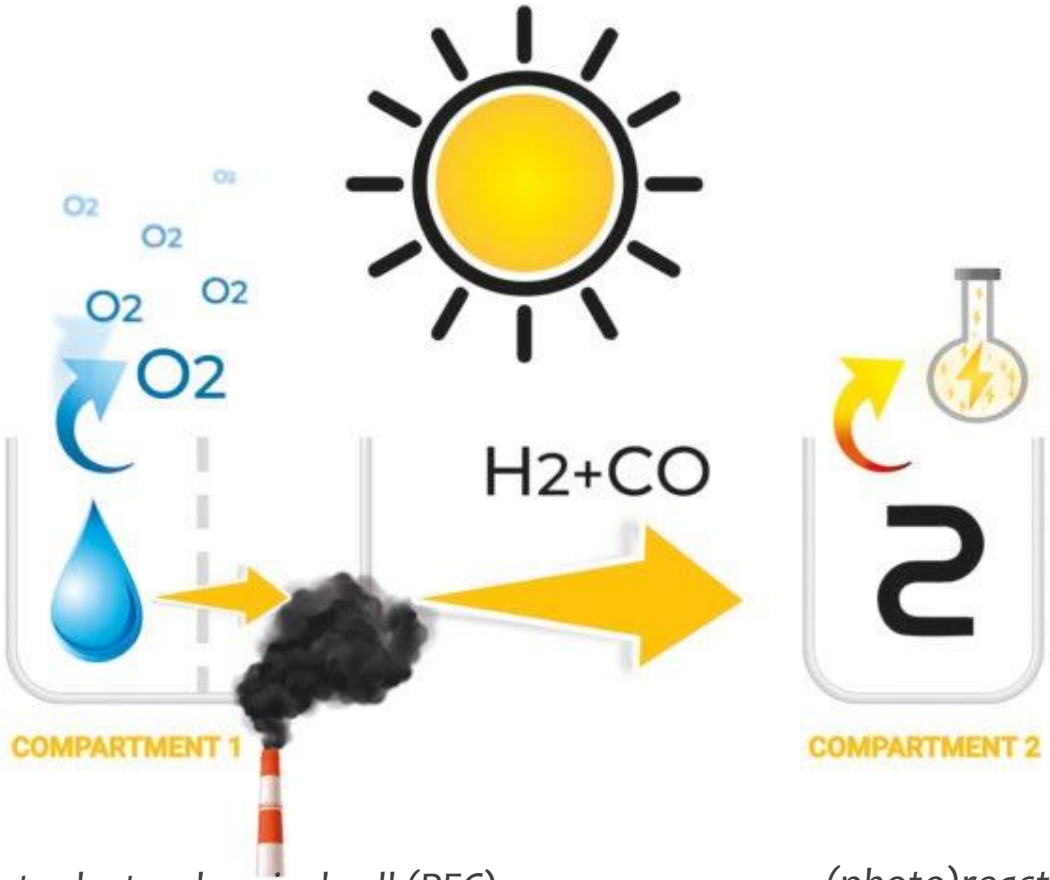
CONDOR project

Project in a nutshell

- **Start:** 01/11/2020
- **Duration:** 48 months
- **Coord:** UNIBO
- **Budget:** € 3,98 M
- **Topic:** LC-SC3-RES-1-2019-2020 Developing the next generation of renewable energy technologies
- **Type of Action:** RIA

Consortium partners

Concept & approach



photoelectrochemical cell (PEC)
H2O + CO2 → O2 + CO + H2
(water splitting)
or
HMF + CO2 → FDCA + CO + H2
(biomass oxidation)

(photo)reactor
CO+H2 → methanol (MetOH)
or
CO+H2 → dimethylether (DME)

- CONDOR targets a **modular device for the production of fuels** by using water and carbon dioxide as feedstock and sunlight as the sole energy source.
- We propose a **photosynthetic** device made of **two compartments**.

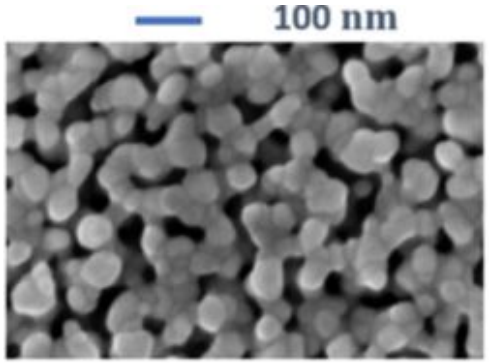
Main Objectives and KPIs

- COMPARTMENT 1 **solar-to-syngas efficiency:**

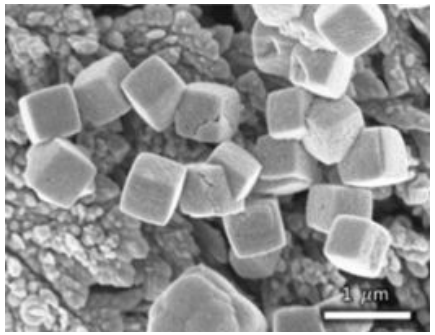
  6% for water splitting

  8% for biomass oxidation

oxide semiconductor photoanode

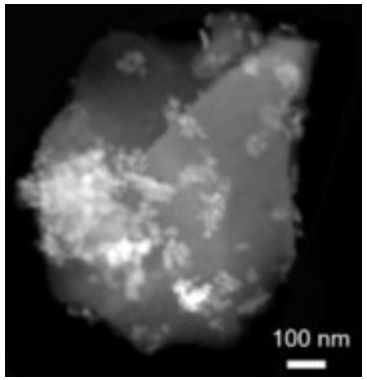


Cu nanocubes cathode



- COMPARTMENT 2 **syngas conversion** to MetOH or DME:

  75% (one pass)

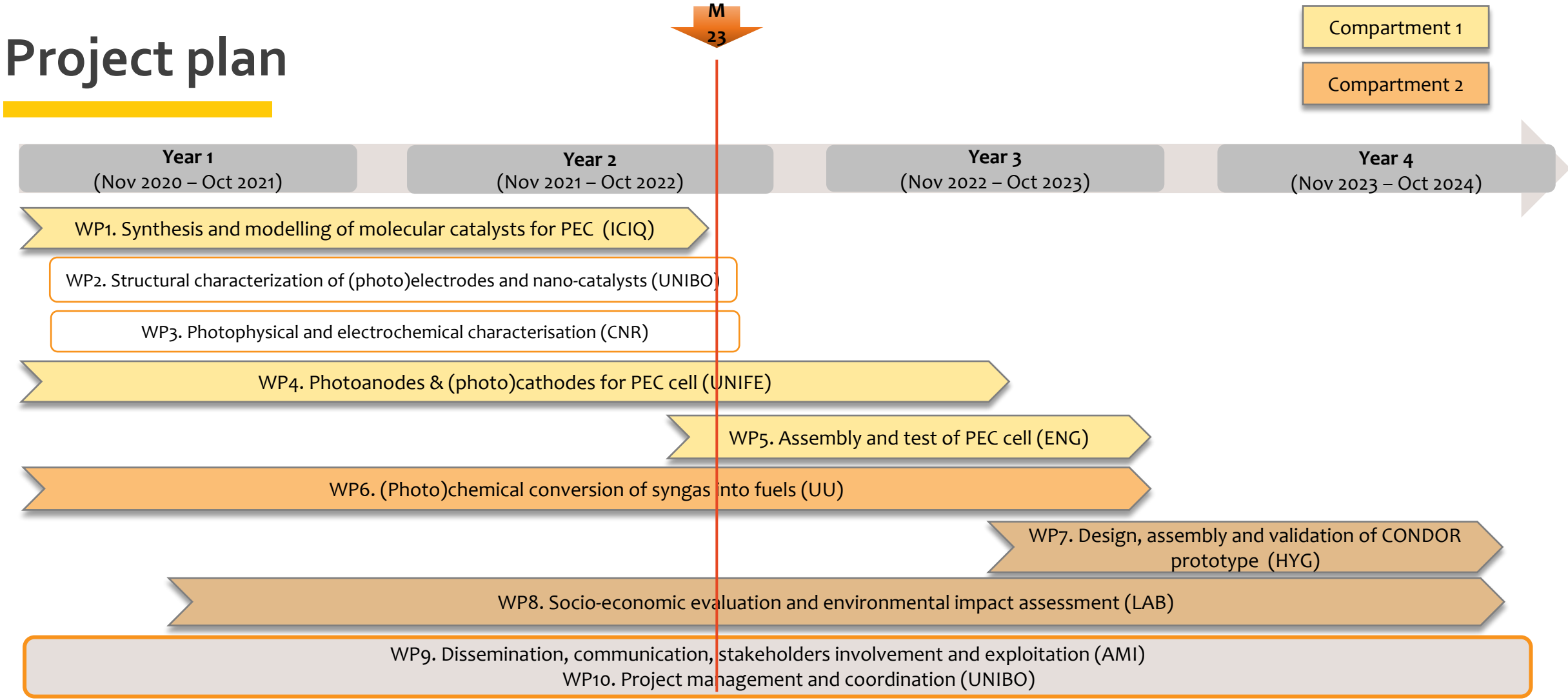


Cu-Zn-Al catalysts

- FULL DEVICE **solar-to-DME efficiency:**

  4.5% for water splitting and **6% for biomass oxidation**

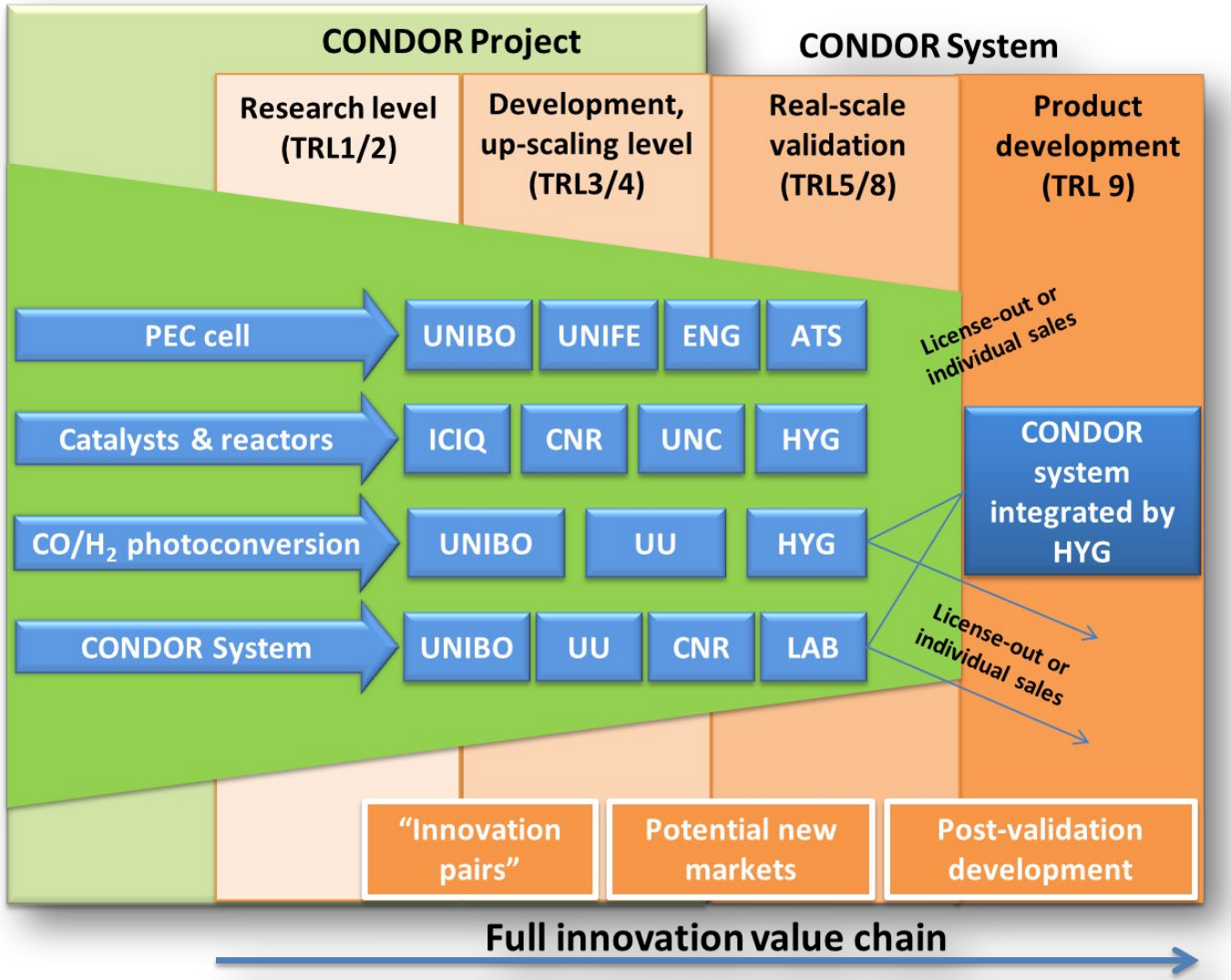
Project plan



Value chain

System installation and validation:

- **Initial test :** lab at HyGear
- **Tests in real open-air conditions** : rooftop terrace of CNR-ISOF in Bologna (Italy)
- **Potential end-user (installation site):** Mejillones bay (Chile, Antofagasta region) – by ENGIE.



Exploitation and dissemination

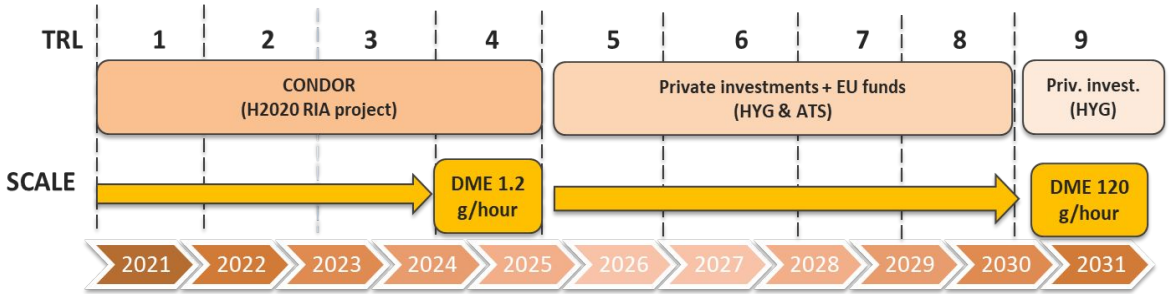
Exploitation

Final end-users:

- chemical and petrochemical industry, oil and gas companies & 'smart' cities
- advanced industry + sunny areas south Europe (ES, IT, EL)

Commercialisation partners: HyGear & ENGIE

✔ by 2030: with 8% solar-to-fuel chemical efficiency of the PEC;
✔ by 2050: decentralized production with 30% efficiency.



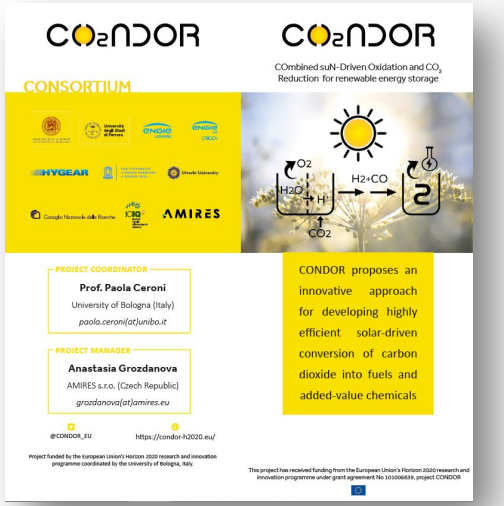
Upscaling of the CONDOR system

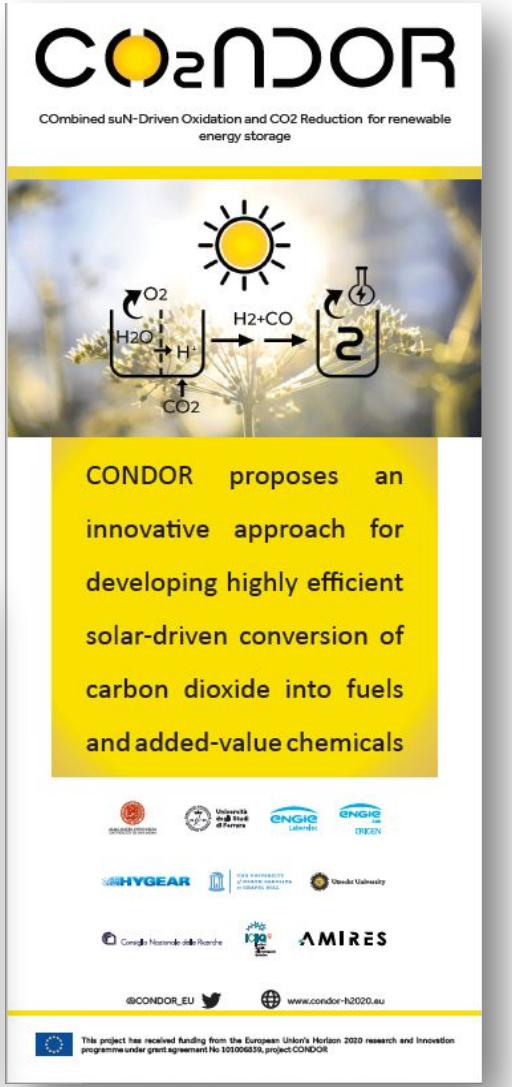
Dissemination

Dissemination activities:

- https://condor-h2020.eu/
- @CONDOR_EU

- Fact sheet , brochure & roll-up
- Participation in conferences





Thank you for your attention!

Project Coordinator:
Prof. Paola Ceroni (UNIBO)
paola.ceroni@unibo.it

Project Manager:
Anastasia Grozdanova (AMI)
grozdanova@amires.eu