



Light assisted solar fuel production by artificial CO₂ Reduction and water Oxidation

Deliverable D6.2

Project Website

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v 0.2	05/11/2020	Lucas Larsen (DBT)	Revision, changes and additions
v 0.3	20/11/2020	Laura López (ICIQ)	Update project page and revision
v 1.0	25/11/2020	Laura López (ICIQ)	Final document following final revision and approval by the Project Management Board

EXECUTIVE SUMMARY

This document, D6.2 Project Website, is a deliverable of the LICROX Project, which is funded by the European Union's H2020 Programme under Grant Agreement No. 951843. The document describes the motivation behind the concept of the website and the objectives as a key tool for dissemination and communication actions. The document provides a description of the content of the public site, defining also the social media tools used.

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D6.2. Project Website

1. PURPOSE OF THE PROJECT WEBSITE DELIVERABLE

The Project Website is one of the deliverables of the WP6: Environmental impacts, social acceptance, dissemination, and exploitation.

The main purpose of this deliverable is to describe the key points of design, execution, content, usage and communication strategy behind the internet platform of the LICROX project. The URL of the website is www.licrox.eu and it has been online since beginning November 2020. The social media accounts of the project were created at the same time. Both the website and social media networks constitute key communication tools to increase project visibility and impact toward the different audiences identified in the Dissemination and Communication Plan (Deliverable 6.1): Scientific community & specialized audience; Industrial sector; Policy actors, Funding agencies and authorities; Citizens and the General public; R&I Networks; Media/Science Communication. They are also important tools for sharing information between LICROX partners.

2. MAIN OBJECTIVES AND RESPONSIBILITIES

The website directly contributes to the main objectives of the Dissemination and Communication Plan (D6.1), as a key dissemination and communication tool it will help to:

- Maximise the visibility of the project, raising awareness of its progress and results, and presenting the consortium members.
- Provide contents and regular updates adequate for the targeted audiences and establish regular analyses to increase their engagement and communication impact.
- Disseminate the activities and documents generated from all Work Packages during the lifetime of the initiative, contributing to promoting the project's results and to the Open Science concept.

ICIQ is the responsible for the development, updates and maintenance of the website and social media, as leader of Task 6.4 Dissemination and communication of the results, in close collaboration with the WP6 leader, DBT, ensuring a high degree of coordination between all the tasks within the WP. All consortium members are responsible for regularly contributing to the contents of the website and are engaged to support the LICROX website by disseminating it through their own websites and social media channels.

3. WEBSITE DEVELOPMENT AND DESCRIPTION

LICROX website is accessible at: www.licrox.eu. The platform has been created to serve as a key tool to support external communication and dissemination of the project objectives and results. The public website has been developed to act as an information hub about the project's goals, participants, activities and results.

The website has been designed following a responsive web design (RWD) to enable optimum visualization independently of the size of the screen (PC, tablet and mobile) or web browser one is viewing with and it will be updated frequently, as required, by ICIQ.

The website displays the following sections:

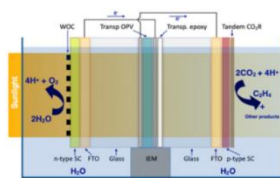
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- **Home:** slide with main highlights, basic title and description of the project, highlights of the latest news and events, consortium information, newsletter subscribing form, access to the other web sections and to the project social networks (Twitter, Instagram and LinkedIn), information on EU funding and contact information.
- **Project:** information about the project's vision, including objectives, team work and a general planning structure.
- **Consortium:** list of all partner institutions taking part in the project, linking to their short descriptions and people involved in the team.
- **News & Events:** pieces of news about the project, interviews with experts, LICROX meetings, and related events.
- **Outcomes:** outcomes generated through the project such as publications, presentations, graphic materials and videos, public deliverables and newsletters.
- **Media:** collection of the press releases, media appearances and coverage of LICROX news published in general and specialized newspapers and magazines, interviews (radio and TV), videos, etc.
- **Contact:** contact form to reach the project team.

The Home page is designed to attract the attention of viewers by exposing the project logo and banner, listing the content of the website. It presents the project at a glance, highlighted news and events and consortium partners (Figure 1).

All sections of the website have on top the LICROX logo and the menu bar enabling quick orientation through the search. All sections also provide, at the bottom, reference to Horizon 2020 and European Commission (EC) support and a disclaimer excluding EC responsibility, a subscribing form to the newsletter and links to social media and contact e-mail.

Light assisted solar fuel production by artificial CO₂ Reduction and water Oxidation



The LICROX Project

Artificial photosynthesis mimics the natural process of converting sunlight to energy stored in chemical bonds. In LICROX we will fabricate and test a photoelectrochemical cell (PEC), an artificial photosynthesis device for converting sunlight, water and carbon dioxide (CO₂) into carbon-based molecules containing 1 carbon (C1) or 2 carbons (C2), capable of storing chemical energy.

[The Project](#)

News & Events

LICROX kicks off

LICROX project funded with 3M€ to convert sunlight into chemical energy

FET Proactive: emerging paradigms and communities, results of the call FETPROACT-EIC-05-2019

Consortium



Funding Agreement

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Newsletter

Name*

E-mail*

By submitting your information, you are giving us permission to email you.

Follow us!

Figure 1. Home Page

D6.2. Project Website

The Project page provides a description of the project and the proposed PEC, as well as an overview of the contributions and interaction of the consortium members, work packages description and a general planning scheme (Figure 2).

[Home](#)
[Project](#)
[Consortium](#)
[Outcomes](#)
[News & Events](#)
[Media](#)
[Contact](#)

Project

In LICROX we will fabricate and test a PEC for converting sunlight into C1 or C2 molecules capable of storing chemical energy

Artificial photosynthesis mimics the natural process of converting sunlight to energy stored in chemical bonds. In LICROX we will fabricate and test a photoelectrochemical cell (PEC), an artificial photosynthesis device for converting sunlight, water and carbon dioxide (CO₂) into carbon-based molecules containing 1 carbon (C1) or 2 carbons (C2), capable of storing chemical energy.

We will target the formation of ethylene, one of the products mostly used by chemical industries for the production of polymers and other materials, with a high energy efficiency (Faradic efficiency (FE) larger than 85%). The PEC will be constructed in a compact tandem structure consisting of a photoanode, a semi-transparent organic solar cell, and a photocathode for a broadband absorption of sunlight to achieve high current densities (above 5 mA/cm²). These photoelectrodes will be coupled to catalysts composed of nanoparticles (NPs) or molecular complexes of non-noble metals (Cu, Fe, Co) to drive the water oxidation and carbon dioxide reduction (CO₂R) reactions in an aqueous electrolyte at near-neutral pH.

Schematic representation of the complete PEC configuration for the generation of solar fuels. The device consists of: (i) left: photoanode incorporating the WOC (Water Oxidation Catalyst) and light scattering elements, (ii) middle: a semi-transparent organic photovoltaic solar cell (OPV), and (iii) right: a nanostructured photocathode coupled to tandem catalysts for carbon dioxide reduction (CO₂R). The two half cells are connected with electrical conductors and the anolyte and catholyte are separated with a suitable ion exchange membrane (EM).

Team

To accelerate the endeavour of converting the triple junction PEC proposed into a working technology for transforming light and CO₂ into compounds capable of storing chemical energy, LICROX brings together an interdisciplinary team of scientists with a comprehensive expertise in materials chemistry, semiconductor physics, electrochemistry, and photonics from EPFL, TUM, ICIQ and ICFO. Designing a strategy by DBT to overcome societal resistance, LICROX will set the route for a new scalable renewable energy technology to be initially pushed towards an industrial implementation and commercialization by Avantama, Hysystech and a newly developed spin-off from ICFO.

Project planification

Project duration: 1 September 2020 to 31 August 2023

Objectives	
WP1	Ethics Requirements ✓ Ensure compliance with the ethics requirements: Environmental protection & safety and data related aspects.
WP2	CO₂R tandem catalysis and WOC ✓ Synthesis of Fe and Cu based WOCs. ✓ Synthesis of tandem CO ₂ R catalysts (Cu NPs and Fe&Co molecular complexes).
WP3	Semiconductors for the photo-anode and cathode ✓ Synthesis of BiVO ₄ /WO ₃ -NP ✓ Synthesis of earth-abundant based photoanodes made of TiFe ₂ O ₇ -NP ✓ Synthesis of nanostructured Cu ₂ FeO ₄ photocathodes aiming at reducing the limitation that both semiconductors bring to the overall performance of the PEC.
WP4	Light trapping in the PEC ✓ Develop a 1/2-dimensional light trapping configuration to computationally demonstrate a 2 x times factor enhancement for the current density in a tandem PEC configuration. ✓ Implement the light trapping configuration on a half-cell based on BiVO ₄ /WO ₃ -NP thin film photoanodes and Ru-based molecular complexes for WOC.
WP5	PEC implementation & validation ✓ Implement half-PEC fabricated using materials containing only earth abundant metals. ✓ Implementation of a chemical product selection and purification system to obtain C2 carbon fuels.
WP6	Environmental impacts, social acceptance, dissemination, and exploitation ✓ Assessment of social acceptance and identification of social, ethical, policy related and environmental consequences, barriers and impacts of the LICROX PEC.
WP7	Project Management ✓ Ensure the proper progress and management of the project and consortium.

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Project planification

Project duration: 1 September 2020 to 31 August 2023

Task	Year 1	Year 2	Year 3
WP1	Ethics Requirements		
WP2	2.1	Synthesis of copper nanocatalysts (Cu-NiC)	
	2.2	Synthesis of molecular catalysis based on abundant non-noble metals	
	2.3	Abundant elements WOCs	
	2.4	CO2R tandem catalysis	
WP3	3.1	BiVO ₄ photoanode fabrication as a model system	
	3.2	CuFeO ₂ based photocathode fabrication	
	3.3	TiFe ₂ O ₇ photoanode fabrication for sustainable high efficiency systems	
WP4	4.1	Light absorption modeling	
	4.2	Implementation of light trapping in half-PEC	
	4.3	PEC light trapping capacity optimized	
	4.4	Testing of CO2R	
WP5	5.1	Testing WOC from abundant elements	
	5.2	Abundant elements PEC incorporating light trapping	
	5.3	Validation of the PEC prototype	
	5.4		
WP6	6.1	Mapping of consequences, barriers & impacts	
	6.2	Citizen perceptions, acceptance and livelihood	
	6.3	Technological readiness, future market potentials and exploitation of LICROX outcomes	
	6.4	Dissemination and communication of the results	
WP7	7.1, 7.2, 7.3, 7.4, 7.5 7.1. Project Coordination and Governance - 7.2. Project Management - 7.3. Administrative and Financial Management - 7.4. Risk Management - 7.5. Gender Issues		

Figure 2. Project Page

The Consortium page shows all partner's logos (Figure 3) and after clicking at each one a short description of the institution appears with a link to the institutional websites, together with the pictures of the team members participating in the project (Figure 4).

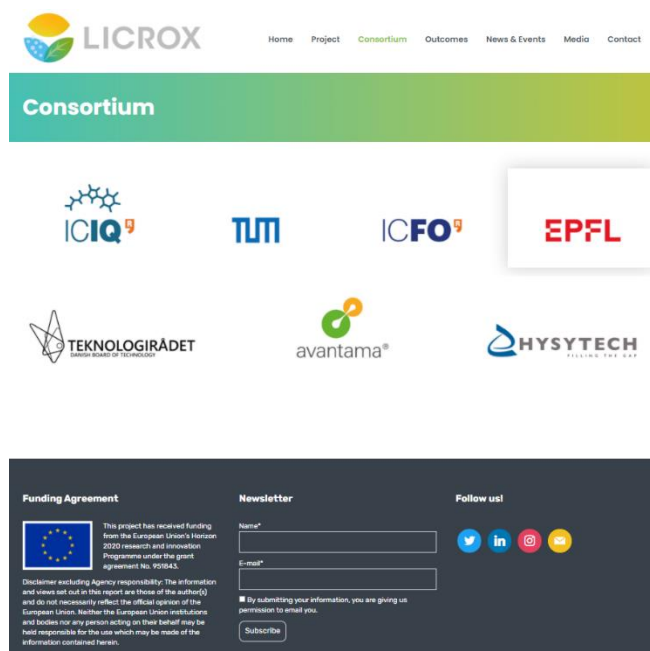


Figure 3. Consortium page

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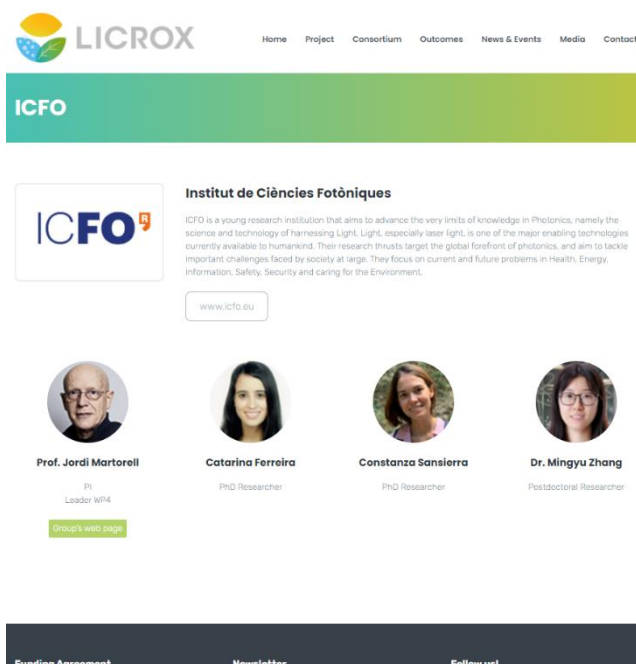


Figure 4. Example of an inner partner's page (ICFO) as part of the Consortium page

The Outcomes page will serve to make public the results and activities of the project, visitors could find the scientific articles published and other dissemination materials as presentations and posters. The newsletters generated through the project will also be available in this page, as well as public deliverables and other documents of interest.

The News & Events page (Figure 5) contains the main highlights of the project, like celebration of consortium meetings, partner's participation in dissemination events, open job positions, etc.



Figure 5. News&Events Page

The Media page will serve as a repository to file articles and interviews related with the project appeared in external media and the press releases produced by the initiative.

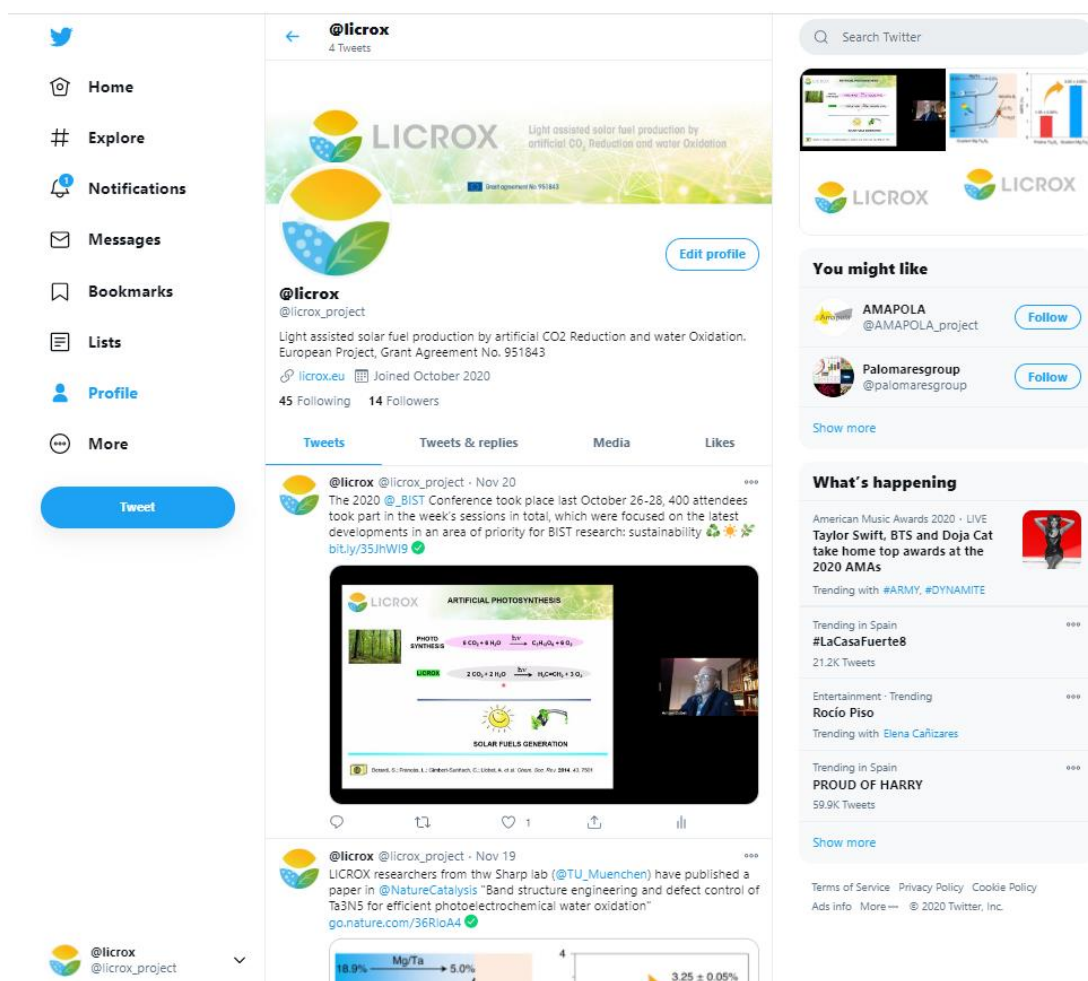
Finally, the website has its Contact page, where the visitors can leave a message by filling out the form. The message is directly sent to the e-mail address created for the project: licroxproject@icq.es. For this contact form, as well as for the subscription to the public newsletter, a GDPR (General Data Protection Regulation) compliance form will display.

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In addition, as explained above, the bottom of each page has direct links to social media channels and the e-mail address of the project.

Regarding social media, there are three active accounts on:

- Twitter: https://twitter.com/licrox_project (Figure 6). It serves to boost the project's visibility among the general audience, researchers, companies and partners, massively, and interact with them.



The screenshot displays the Twitter profile for @licrox_project. The profile bio states: "Light assisted solar fuel production by artificial CO₂ Reduction and water Oxidation. European Project, Grant Agreement No. 951843". The page shows two tweets:

- A tweet from Nov 20: "The 2020 @BIST Conference took place last October 26-28, 400 attendees took part in the week's sessions in total, which were focused on the latest developments in an area of priority for BIST research: sustainability".
- A tweet from Nov 19: "LICROX researchers from thw Sharp lab (@TU_Muenchen) have published a paper in @NatureCatalysis 'Band structure engineering and defect control of Ta₃N₅ for efficient photoelectrochemical water oxidation'". Below the text is a bar chart showing a decrease from 18.9% to 5.0% for Mg/Ta, and a value of 3.25 ± 0.05%.

Figure 6. LICROX Twitter page

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- LinkedIn: <https://www.linkedin.com/company/licrox-project/> (Figure 7). It serves to promote the initiative among a specialized community. It emphasizes LICROX news and events, as well as other relevant items.

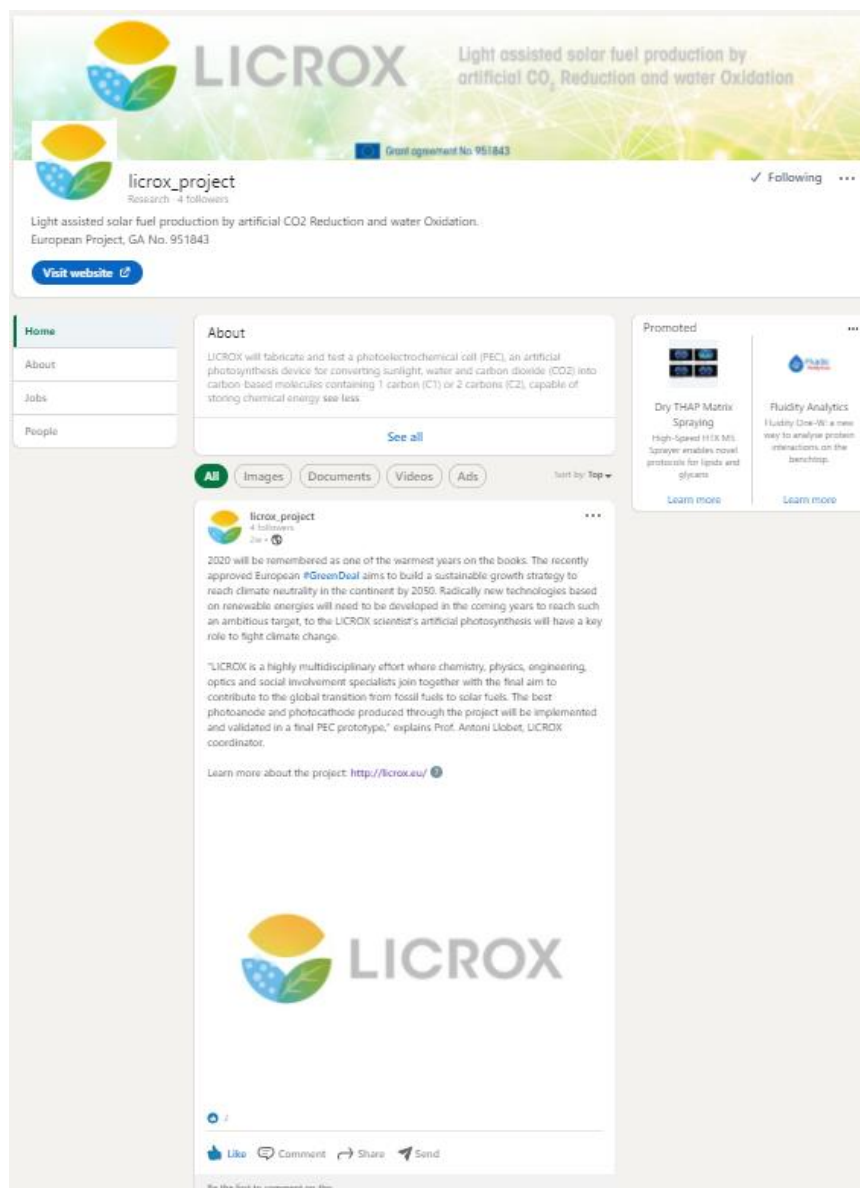


Figure 7. LICROX LinkedIn page.

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- Instagram: https://www.instagram.com/licrox_project/?hl=en (Figure 8). It serves to promote the initiative's actions, it will be especially important to show pictures and videos of the LICROX experiments and engage the younger members of the team in the project's communication efforts.

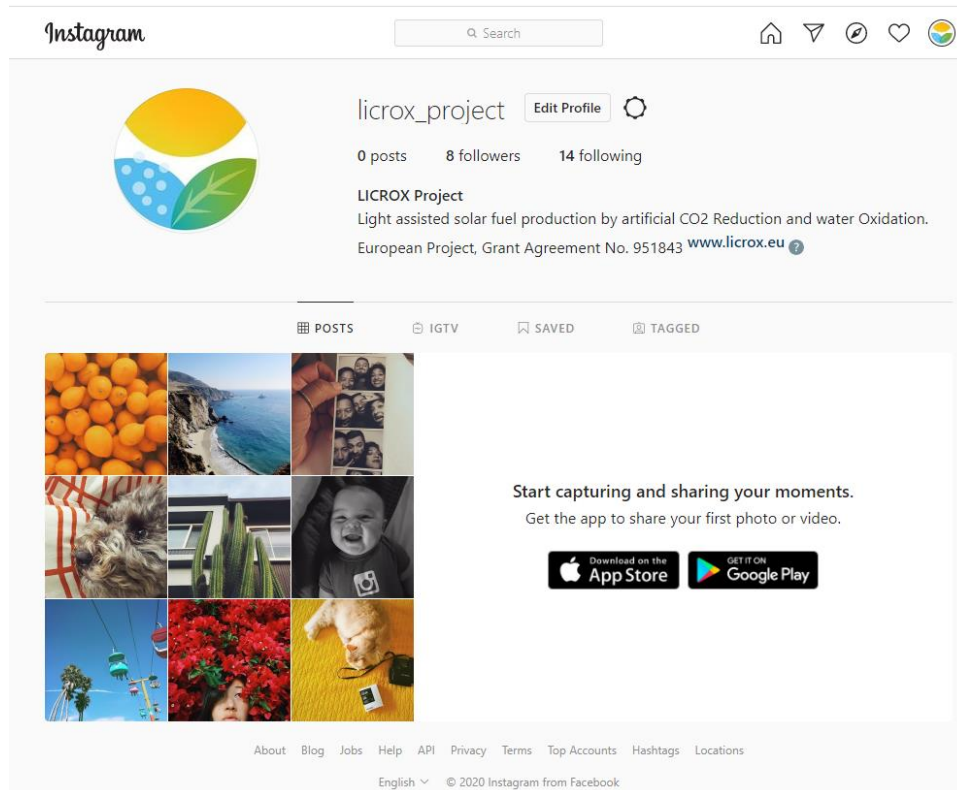


Figure 8. LICROX Instagram profile.