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**Demonstration of an innovative
Building Integrated Photovoltaic system toward net-zero-energy
buildings**

After-LIFE Plan *(Publishable summary)*

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Beneficiary:	COMSA Corporación, COMSA Industrial, COMSA SAU

Summary

The After-LIFE Plan is the planning document for the actions that will take place after the end of the LIFE BIPV project. The objective is to set out the lines for the continuation of the work on LIFE BIPV to achieve replicability of the project and to multiply its impact.

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EXECUTIVE SUMMARY

The After-LIFE Plan is the planning document for the actions that will take place after the end of the LIFE BIPV project, in December 2023. The After-LIFE Plan encompasses the foreseen actions that partners will undertake for a period of five years (January 2024 until December 2028) with the aim of setting out the lines for the continuation of the work on LIFE BIPV to achieve the maximum replicability and successful transferability of the project.

The specific objectives of the After-LIFE Plan are:

- To meet the contractual requirements of this task.
- To present an overview of the project and an assessment of the situation at the end of the project;
- To define the after-LIFE objectives and methodology;
- To identify funding needs and sources of funds.

In particular, the present document sets out how partners will contribute to the following different activities once the project concluded:

- Monitoring and data analysis of the two project demosites.
- Dissemination and communication of project results.
- Fostering replicability of the LIFE BIPV product.
- Promoting future R&D projects.

Finally, the document presents an economic estimation and a monitoring scheme of the foreseen After-LIFE Plan activities.

1. LIFE BIPV project results

Energy production on-site is a sustainable strategy that will enable existing and new buildings decreasing their climate change impact. In this context, building integrated photovoltaic (BIPV) approaches have an important role in increasing the renewables' share in the EU grid and the buildings' efficiency throughout EU.

In line with this statement, LIFE BIPV project set three main objectives to boost the use of the innovative BIPV systems. Below, a description of the results achieved for each of the project objectives at the end of the project, in December 2023.

OBJECTIVE 1

To demonstrate a direct CO₂ emission decrease of at least 35% of a typical (non-residential) building in Europe (excluding northern Europe) and to decrease the carbon footprint of the solar harvesting technology by 67%.

LIFE BIPV solution has been installed in two existing in Germany and Spain to test the impact and demonstrate the applicability of the approach in existing buildings.

Berlin demosite

476m² of 30W modules

Annual expected decrease of 13.65t CO₂e/year

Results at the end of the project

12.7 MWh/year of energy produced

Results GHG emissions:

- 32 g CO₂e / kWh (as is for 30W modules, i.e. only ~4.2% APE) → **6.93 tCO₂/year avoided**
- ~14 g CO₂e / kWh for 10% APE assumed → **16 tCO₂/year avoided**
- Project target (@10% APE): 15 g / 13.65 tCO₂

Barcelona demosite

115m² of 35W modules

395m² of 50W modules

Annual expected decrease of 12.85t CO₂e/year

Results at the end of the project

23.6 MWh/year of energy produced

Results GHG emissions:

- 18.5 g CO₂e / kWh (as is for 45W avg modules, i.e. only ~6.3% APE) → 6.6 tCO₂/year avoided
- ~7.4 g CO₂e / kWh for 10% APE assumed → 16.6 tCO₂/year avoided

Project target (@10% APE): 10 g / 12.85 tCO₂

OBJECTIVE 2

To prove the economic feasibility of the BIPV system at demonstration-scale

Feasibility has been monitored and proved through the Levelised Cost Of Electricity (LCOE). An LCOE between 15 ct/kWh and 28 ct/kWh for Central, Eastern, Western and Southern European countries was expected.

Berlin demonstrator

Results LCOE:

- 0.69 €/kWh (as is for 30W modules, optimal installation case)
- ~0.28 €/kWh for 10% APE assumed and today's module prices
- Project target (@10% APE): ≤0.28 €/kWh

Barcelona demonstrator

Results LCOE:

- 0.28 €/kWh (as is for ~45W avg modules)
- ~0.18 €/kWh for 10% APE assumed and today's module prices
- Project target (@10% APE): ≤0.28 €/kWh

OBJECTIVE 3

To widely disseminate the project's results

- Show-case the impact on reduction of CO₂ emissions towards net-zero-energy buildings
- Reinforce the replication potential in EU for the construction and other sectors.
- Review and push forward the standards in the construction/renovation sector.

Partners have contributed into the dissemination of project results, globally and each of them specifically in their field of action. The diversity of possible beneficiaries is broad and includes professional sectors such as the energy, construction and infrastructures, collaborative networks (such as the European Construction Technology Platform) and the general public. Throughout the project lifetime, many dissemination activities have been carried out. Results are summarized below:

- Networking with other EU projects (namely CREATORS, SUSTAIN Cluster and PIF-Building Energy Improvement).
- Set up of the LIFE BIPV website.
- Installation of LIFE notice boards in the demonstrators and at HTK headquarters
- Creation of dissemination materials (flyer, roll-up, videos, display foyer, Layman's Report)

- Inauguration ceremonies of the two demonstrators with the presence of stakeholders and local authorities and local/regional/national press.
- Wide presence on the social media (X and LinkedIn posts)
- Attendance to international Tradeshows (Smart City World Expo Congress, ENLIT and INTERSOLAR)
- Presentation of the project at technical workshops (Baueffizienztagung in Germany, ISFOC and a webinar of the SUSTAIN Cluster in Spain)
- Organisation of online Expert Webinars
- Presentation of the project in other dissemination activities as:
 - CORDIS Synergy Info Pack
 - COMSA “Good Environmental Practices” Catalogue
 - COMSA participation in the International Day against Climate Change
 - Catalogue about “Good environmental practices for the 2030 Agenda” of the CEOE - *Spanish Confederation of Business Organizations*
 - European platforms (European Technology Platform, ENLIT.World).

2. Demo-sites monitoring and analysis

2.1 Demosites monitoring and data analysis

Once the LIFE BIPV project finished, partners will continue the monitoring of the two project demosites for at least a period of 5 years. Partners will:

- **Perform periodic site inspections** that will include a detailed visual check of all system components, including all modules and wiring.
- **Collect data** (DC power output, AC power output, current, voltage, irradiation, environmental temperature and time) that will be accessible in real-time via the online platforms of the inverter supplier and the monitoring system.
- **Process data** (read data from any source, convert the data to fit the standard structure, to remove suspicious data points, empty cells, unit conversions, etc.).
- **Report data** (automated reports and graphs will be generated and will be used for general overview and further analysis).

3. Dissemination and Communication activities

Once the LIFE BIPV project concluded, partners will continue publicizing it and drawing attention to the results obtained by the two demonstrators, to help ensure that project's impact persists in the period 2024-2028.

3.1. LIFE BIPV project website

The website set up for the project will remain in place for at least five years and its content will be updated regularly to include the activities of the After-LIFE plan and the results of the monitoring of the demonstrators. The domain www.lifebipv.eu will remain active for at least 5 years.

3.2 Dissemination of LIFE BIPV project and demo-sites results through partner's webs and social media

Partners have agreed to continue the dissemination of project related news to their respective websites and social media (mainly LinkedIn and X) as they have done during the project lifetime.

3.3. Participation in events, tradeshow, technical workshops

The consortium has committed to promote the dissemination of LIFE BIPV project and demo-sites results in different national, European and international tradeshow, fairs and related events.

3.4 Use of the project dissemination material

Dissemination material created during the project (flyer, roll-up, videos, Layman's Report etc..) will continue to be used and distributed among the target audience in tradeshow, technical workshops, project website and partners' websites, etc. with special emphasis on those prepared in the last months and that include the final results (Layman's Report). New materials may also be produced.

3.5. HTK's expert webinars

The expert webinars are online courses carried out by HTK's professionals to inform and train customers, installers, partners and leads about the innovative solar films with the purpose of disseminating the technology in different markets and user groups.

HTK will continue to organize expert webinars once the project concluded, especially during 2024 and 2025, from 5-10 each year.

4. Commercial activities: BIPV replicability and transferability

LIFE BIPV project is a close-to-market project that has launched the an innovative BIPV solution that offers clear environmental benefits. Closed-to market projects have a high level of technical and business readiness. This means that solutions could be implemented in close-to-market conditions (at industrial or commercial scale) during the project or shortly after its completion. Thus, in the After-LIFE plan phase, the consortium will be focused on the replicability, transferability and commercialization of the solution.

4.1. Collaboration for the implementation of the BIPV technology in buildings, infrastructures, and new potential markets

Partners are committed to continue the collaboration for the implementation of the solution not only in the construction and infrastructure markets but also in new sectors such as:

- Short term: flat / profiled / curved facades, metal roofs and curved roofs
- Mid term: agricultural PV (protected and greenhouse)
- Long term: Trucks / Bus / Camper recreational applications

4.2. Site-visits with potential clients and decision makers

HTK and COMSA will arrange visits to the demosites with potential customers. Some visits have already been arranged during the project lifetime.

4.3 Commercial agreements HTK-COMSA to enhance the technology implementation

COMSA and HTK will explore the possibility to formalize commercial agreements to foster the marketable exploitation of the LIFE BIPV solution in some sectors and countries.

5. R&D activities

5.1. Collaboration for the development and demonstration of the BIPV technology through R&D national and European projects

COMSA and HTK will explore the possibility to collaborate in future research, innovation and/or demonstration projects at national or European level in the framework of the BIPV sector.

6. Monitoring of the After-LIFE Plan

The After-LIFE Plan has a duration of 5 years, until December 2028.

To monitor the progress of the foreseen After-LIFE Plan activities, the consortium will arrange at least annually meetings (and whenever needed) to guarantee and analyze the continuation of the different activities.
