

# WHAT IS ETFE?

ETFE IS A FLEXIBLE, DURABLE AND SUSTAINABLE MATERIAL FOR ARCHITECTURAL DESIGN



Ethylene TetraFluoroEthylene (ETFE) is a fluorine-based plastic which is lightweight, transparent, recyclable and strong. It weighs only 1% of an equally-sized glass panel and makes comparative energy savings of around 30% as it lets in more light and is a better insulator of heat. ETFE is also dirt and wear resistant and can be kept clean by rainfall.

ETFE is used in buildings as a two or three layered, air-filled cushion, or as a single layered cable-supported structure. When used as an air-filled cushion, the ETFE foil is supported by an aluminium frame. Due to its light weight, ETFE can be used where large expanses of glass would be too heavy, to improve internal building conditions by providing light, and thermal and acoustic insulation.

Further, the cushions can be installed with electronic equipment and LEDs, or printed on with different colours and designs for elaborate building façade decoration and illumination.

The integration of lighting function into ETFE is increasingly popular in architectural usage, but consumes large amounts of energy, with high costs of operation.

The ETFE-MFM project will address these issues by exploiting the advantages of Photovoltaics, LED lighting and energy storage concepts as parts of ETFE building structures.

ETFE-MFM BRINGS TOGETHER A MULTI-DISCIPLINARY TEAM, WITH OUTSTANDING RESEARCH, TECHNOLOGICAL, MANUFACTURING AND BUSINESS EXPERTISE



ITMA Materials Technology (ES)  
www.itma.es



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www.cener.com



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VISIT THE PROJECT WEBSITE AT  
[WWW.ETFE-MFM.EU](http://WWW.ETFE-MFM.EU)

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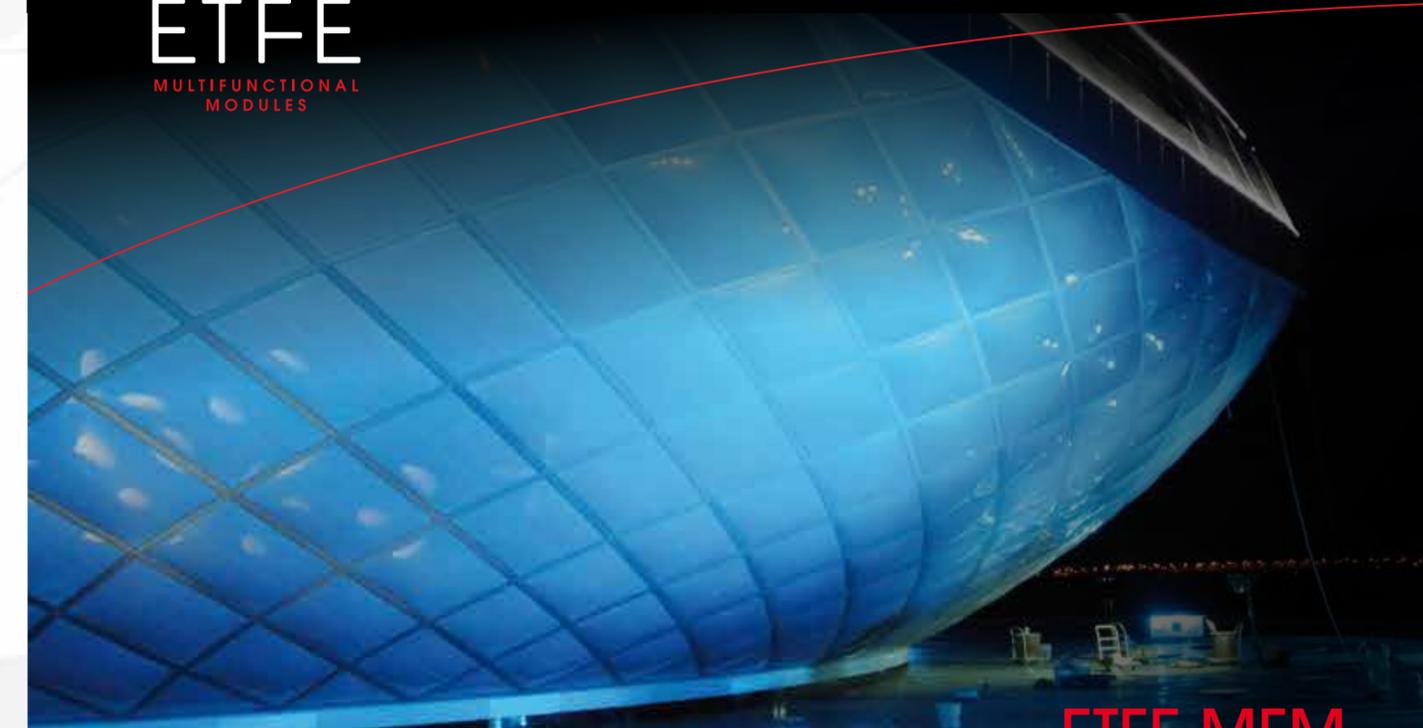


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*Pictures provided by Taiyo Europe*



ETFE  
MULTIFUNCTIONAL  
MODULES



ETFE-MFM

DEVELOPMENT AND  
DEMONSTRATION OF FLEXIBLE  
MULTIFUNCTIONAL ETFE MODULE  
FOR ARCHITECTURAL  
FAÇADE LIGHTING

# BIPV

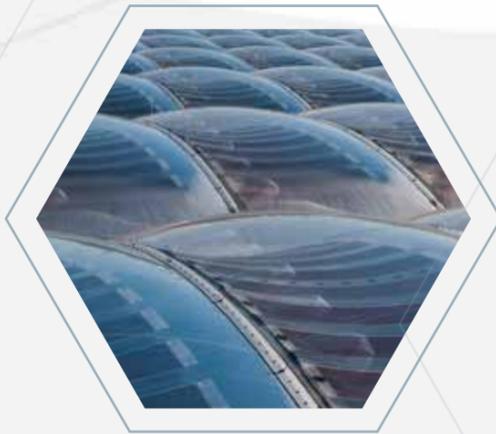
## BUILDING INTEGRATED PHOTOVOLTAICS PROVIDE DECENTRALISED ENERGY GENERATION FOR SELF-SUFFICIENT BUILDINGS

Buildings are currently responsible for around 40% of total energy use in the European Union. Solutions such as ETFE can play a key role in improving energy efficiency in buildings, but energy efficiency needs to be coupled with renewable energy solutions for greatest impact.

**Building Integrated Photovoltaics (BIPV)** are PV products that are integrated into a building as construction elements, requiring specialised materials and integrated planning and design.

Increasingly, people are turning to decentralised and renewable energy generation for a wide variety of applications. With the recognition that PV systems are reliant producers of electricity that require minimum maintenance and have a proven life-span of 20-30 years, BIPV is a fast growing industry.

PV modules are usually installed on roofs as Building Added PV (BAPV), but can also be integrated into walls, facades and glazing as construction elements, and increasingly novel uses are emerging in the shape of BIPV.



# OUR PROJECT

## DEVELOPMENT AND DEMONSTRATION OF A FLEXIBLE MULTIFUNCTIONAL ETFE-MFM MODULE FOR ARCHITECTURAL FAÇADE LIGHTING

ETFE has great potential for improving both the energy efficiency and design of buildings. If the cost of integrated façade lighting could be reduced, then take-up of ETFE as an eco-friendly building material could increase, in a variety of building types.

The ETFE-MFM project will develop a PV module with embedded additional functionalities designed to be integrated in ETFE textile architecture for Building Integrated Photovoltaic (BIPV) applications. Overall, the project will provide a sustainable building module suitable for energy harvesting, glazing, lighting and insulation.

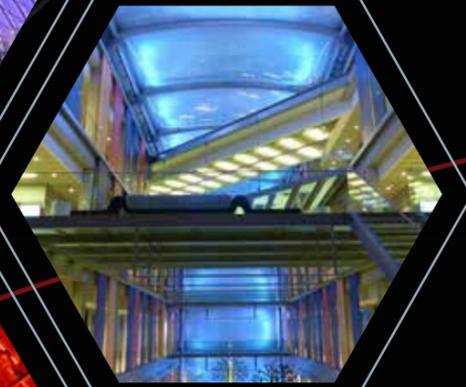
The self-contained building module will consist of ETFE architecture, PV technology, illumination devices, external battery storage and flexible integrated circuits. The project will therefore provide an attractive Multifunctional Module that will generate and store electricity, which can be used to power impressive visual displays, and thus boost uptake of an emerging sustainable construction material.



The module hopes to bring ETFE architecture from a niche product, to a material with wide application. This will result in ecological and societal benefits, including CO<sub>2</sub> reductions, construction cost savings, enhanced building quality and greater energy independence.

### THE ETFE MULTIFUNCTIONAL MODULE

- Light-weight ETFE plastic
- PV module for electricity generation
- Illumination devices (LED or OLED)
- Flexible integrated circuits for control of the PV and LEDs
- External battery for electricity storage



The ETFE-MFM project will demonstrate the developed module on a building in real conditions, so that the overall performance of the module will be monitored and evaluated.

