The main objective of the NMP "Advanced Materials and Nanotechnology" Projects Cluster is to join efforts in order to promote synergies and fields of cooperation.

AMANAC will allow the involved projects to be more productive, competitive, successful and support them to establish a broader impact.

AMANAC projects are grouped in Thematic Areas to facilitate increase of impact:

- Area 1: Nano-Insulation
- Area 2: Embodied Energy
- Area 3: HVAC
- Area 4: Smart Windows
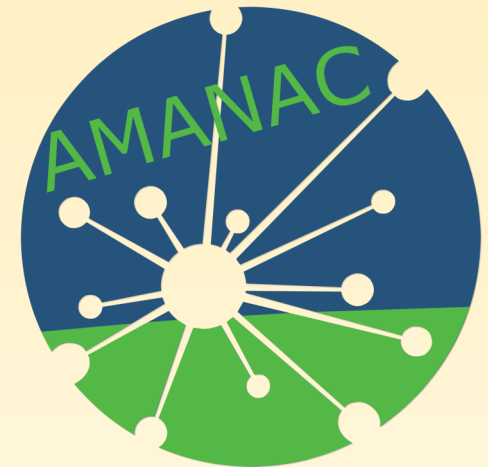- Area 5: Lightweight Components
- Area 6: Indoor Air

ADAPTIWALL

http://www.adaptiwall.eu/

SESBE
Smart Elements for Sustainable Building Envelopes

http://www.sesbe.eu/

ELISSA

http://www.elissaproject.eu/

foam build

http://www.foambuild.eu/

MF RETROFIT

http://www.mf-retrofit.eu/

AMANAC

ADVANCED MATERIAL & NANOTECHNOLOGY CLUSTER

Lightweight Components

E2B Energy Efficient Buildings

SEVENTH FRAMEWORK PROGRAMME

ADAPTIWALL— Multi-functional light-weight WALL panel based on ADAPTive Insulation and nanomaterials for energy efficient buildings

ADAPTIWALL focuses on retrofitting by using nanotechnology to develop a multi-functional and climate adaptive panel for energy-efficient buildings. This novel panel consists of 3 elements:
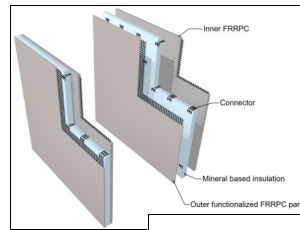
1. Lightweight concrete with nano-additives for efficient thermal storage and load bearing capacity.
2. Adaptable polymer materials for switchable thermal resistance.
3. Total heat exchanger with nanostructured membrane for temperature, moisture and anti-bacterial control.

Light, adaptive/ No auxiliary installation/ Integrated prefab system /Quick, low-cost

BREAKTHROUGH

ON OFF

ADAPTIWALL
LIGHT, ADAPTIVE
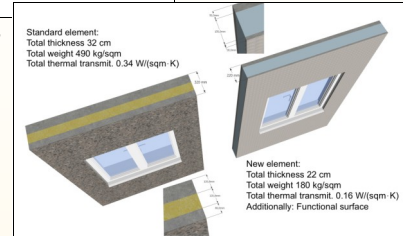NO AUXILIARY INSTALLATION
INTEGRATED SYSTEM = QUICK LOW-COST
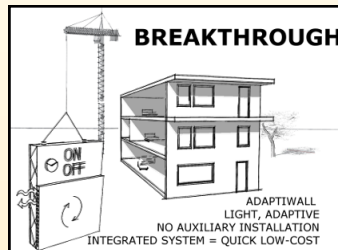
SESBE —Smart Elements for Sustainable Building Envelopes

SESBE will provide new solutions for lightweight, energy efficient and safe façade elements. Nanomaterials and nanotechnology will be used as a tool to custom design functional and performance properties of façade sandwich elements for new constructions and half elements for refurbishment of existing buildings as well as a new type of sealing tape and intumescent coating for fire protection.


Inner FRRPC

Connector

Mineral based insulation

Outer functionalized FRRPC panel

New smart and lightweight sandwich panels including an adequate anchorage system

Standard element:
Total thickness 32 cm
Total weight 490 kg/sqm
Total thermal transmit. 0.34 W/(sqm·K)

New element:
Total thickness 22 cm
Total weight 180 kg/sqm
Total thermal transmit. 0.16 W/(sqm·K)
Additionally: Functional surface

New type of intumescent coating for the fire protection of anchors and metal structures

ELISSA — Energy Efficient Lightweight-Sustainable-Safe-steel Construction

ELISSA targets the development, testing, assessment and demonstration of **nano-enhanced lightweight steel skeleton/dry wall systems with improved thermal, vibration/seismic and fire performance**, due to the inherent damping and fire spread prevention properties of carefully preselected inorganic nanomaterials (aerogels, VIPs, MMTs, CNT) and MEMS. Their implementation, achieved via the development of industrially friendly application methods, will yield new multifunctional prefabricated elements with improved thermal properties that will be structurally tested and optimized as load bearing elements, capable of sustaining from weak vibrations up to medium and severe earthquakes.
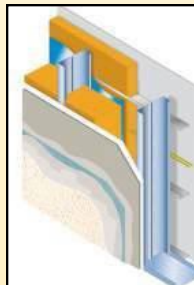
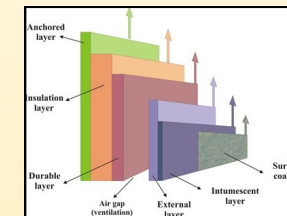**The Cocoon "transformer" static load bearing system**

FoAM-BUILD — Functional Adaptive Nano-Materials and Technologies for Energy Efficient Buildings

FoAM-BUILD will develop a next generation external thermal insulation composite system (ETICS)

Designed to **improve insulation** for both new and existing buildings

foam build

including a nano-cellular thermoplastic particle foam to achieve high thermal insulation behaviour and a new halogen-free flame retardant to eliminate persistent, bio-accumulative and toxic (PBT) materials. A moisture control system will be developed using data from moisture and temperature sensors combined with an intelligent system for moisture prediction. The system will respond by activating a ventilator system to dry and therefore prevent the façade from algae/fungi growth.

MF-RETROFIT — MultiFunctional Facades of reduced thickness for fast and cost-effective retrofittinG

Anchored layer

Insulation layer

Durable layer

Air gap (ventilation)

External layer

Intumescent layer

Surface coating

MF-RETROFIT project aims to deal with the numerous requirements of facade panel retrofitting by developing a light-weight, durable, cost effective and high performance panel. Its layered structure allows for separate but also synergistic function regarding high thermal and acoustic insulation, excellent mechanical properties, up to standards flame retardancy and photocatalytic activity.