GREBE

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EUROPEAN UNION
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European Regional Development Fund

EcoSmart External Insulation Energy Efficiency

Introduction

EcoSmart External Insulation Ltd. are an energy efficiency company based in Castlerea, Co. Roscommon in the West of Ireland. EcoSmart External Insulation Ltd. provide external insulation services nationwide to all parts of Ireland. The owners of EcoSmart External Insulation Ltd. are both from an engineering and architectural background and initially formed a partnership in 2009, after working together since 2007 on construction projects using Insulated Concrete Formwork (ICF).

As a result of the economic downturn and subsequent changes in the construction industry in Ireland, the partners decided to continue working together and focus on renewable energy technologies and energy efficiency in construction. In 2011, they formed a partnership with a UK construction company and formed a new company Cara EcoSmart Ltd. where they were worked on projects in the UK funded by the Green Deal Scheme. Cara EcoSmart Ltd. required a robust quality assurance system, and adopted and modified one which was used by other partners in the company. This knowledge transfer proved very valuable when tendering for contracts in Ireland.

In 2013, they formed EcoSmart External Insulation Ltd., and the construction sector slowly started recovering in early 2014 with people investing more on home improvements. The SEAI reintroduced and increased grant funding to approximately €4,500. This depended on the scale of energy efficiency measures undertaken. The availability of this grant made a very big difference in the mentality of people and they were prepared to undertake energy efficiency upgrades.

Case Study Approach

The data on the market access of renewable energy technologies were collected both from the case studies in different renewable energy technology projects and from the secondary sources. To collect specific project data, a template was established with following subsections:

- **Technology description and a project summary**
  - Innovative characteristics
  - Technology readiness level
  - Available product / service supports from the manufacturer
  - Any standard procedures / requirements for integrating the technology into existing electricity networks, buildings and/or mainstream energy appliances / systems
- **Commercialisation of the technology**
  - Is the technology already a commercial solution?
  - Are there re-sellers of the technology, or is the technology available only from the manufacturer?
  - Identified main market area
- **Cooperation partners and networks**
  - Description of the roles of the co-operation partners and networks in the RE technology project.
  - How have they supported the market access of the technology?
- **Assessment of the technical and economic risks**
  - What kind of procedures have been made for assessing the technical and economic risks of the project
  - Who is bearing the risk of the investment (manufacturer, client, shared between them)?
  - Is the public sector involved in risk sharing? (e.g. co-financing, or platform for technology demonstration)
- **Drivers and barriers in the RE technology project**
  - Main drivers in carrying out the RE technology project
  - Barriers, and how they have been overcome (such as price of energy, availability of resource, specific expertise, policy enabling the technology)
- **Funding and support mechanisms**
  - The financial support received by the project: amount/support rate, type and purpose of the support, agency providing the support, significance of the support for the project
  - Types of soft support/advisories received during the project: the use of soft supports (advisory, training, mentoring etc.) during the technology development or implementation, and how successful these have been
- **Monitoring the performance**
  - How are the technical/non-technical aspects of the RE technology case monitored?
  - Information on the design, installation requirements and procedures, operational performance, and costs/financial arrangements
- **Conditions for the technology transfer & adaptation in different partner regions**
  - What are the main requirements/preconditions for transferring the technology and applying it in other partner regions?
  - Description of the main drivers and barriers for the technology transfer (such as. Energy price, resource needs, certain support etc.)
- **Project results**
  - Benefits & lessons learnt
  - Post- project benefits

Technology Description

EcoSmart use external insulation materials are provided by ATLAS/AVAL External Thermal Insulation Composite Systems (ETICS) who are based in Poland.

ATLAS External Thermal Insulation Composite System (ETICS) with render coatings has been given European Technical Approval no. ETA-06/0081 issued in accordance with guidelines of European Technical Approvals ETA 004:2000 and NSAI-Irish Agrément Board Certificate No. 10/0347. Thermal insulation is made from polystyrene boards fixed to the external wall followed by reinforced layer and then a render coating. ATLAS can be used only as an adhered system or as an adhered system with additional mechanical fixing.

The system can be applied on new or existing external surfaces of vertical walls (plastered or not) made from masonry such as bricks, blocks, stone, cellular concrete or concrete. The system can also be fixed to horizontal surfaces other than roofs. These may include ceilings over passages, internal walls and roofs (on the ceilings side) of garages or cellars adjacent to heated rooms.The ATLAS/AVAL External Thermal Insulation Composite Systems (ETICS) comprise insulation board (bonded and mechanically fixed) with reinforced undercoat, and decorative finishes.

TRL and Technology Scale

The technology readiness level of ATLAS External Thermal Insulation Composite System (ETICS) is 9 as it is an actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space).

EcoSmart will assess each building and offer professional advice to clients on the energy efficiency measures and any grants available for them to avail of. All external insulation measures are in compliance with the required building regulations.

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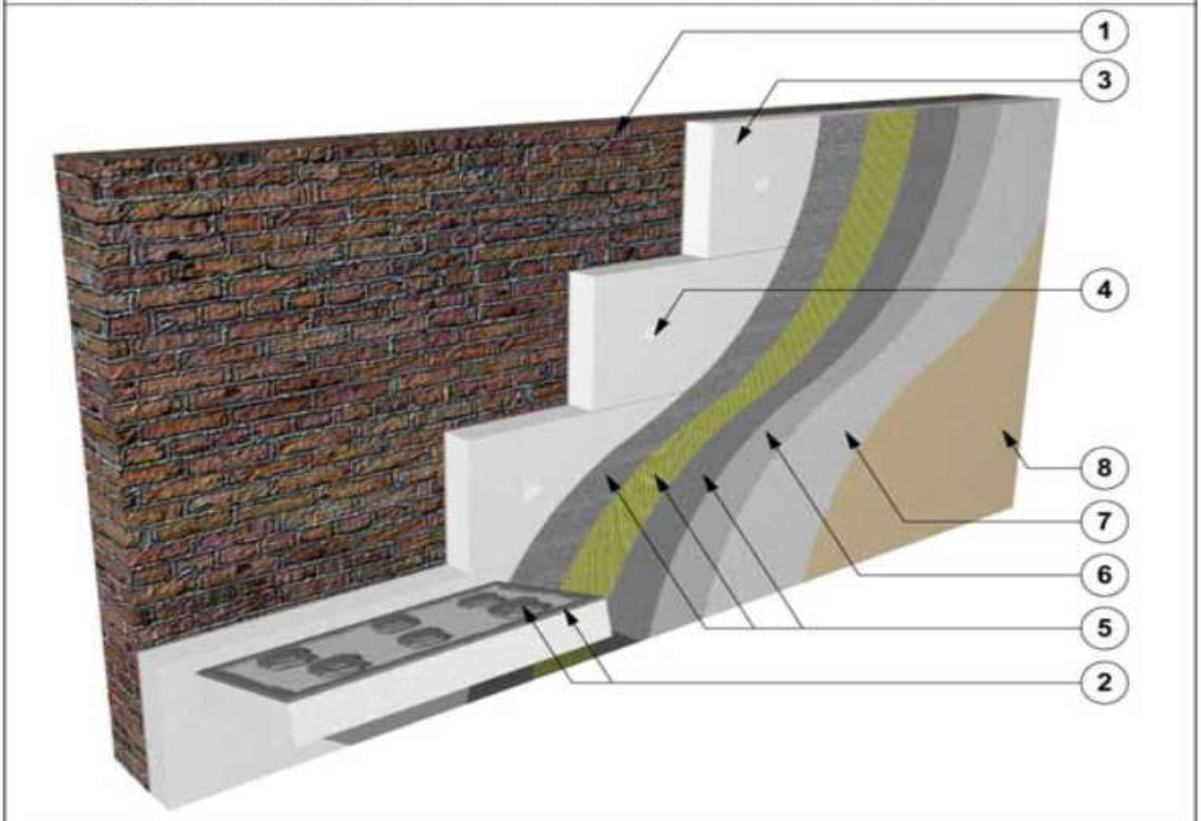
Cooperation partners and networks

EcoSmart is a limited company owned by two people from an engineering and architectural background. The owners developed a partnership in 2009 while working on construction projects and energy efficiency upgrades. In 2011, they strengthened their partnership and formed an alliance with a UK based company to form Cara EcoSmart Ltd., where they worked on energy efficiency projects funded by the Green Deal scheme in the UK. In 2013 they founded EcoSmart External Insulation in Ireland.

Figure 1.

Thermal Insulation Composite Systems ATLAS/AVAL

Layers of Thermal Insulation Composite System ATLAS/AVAL with expanded polystyrene boards EPS (standard and elastified)



1. Substrate
2. Insulation adhesive
   - ATLAS STOPTER K-10/AVAL KT 83
   - ATLAS STOPTER K-20/AVAL KT 85
   - ATLAS HOTER S/AVAL KT 53
   - ATLAS HOTER U/AVAL KT 55
3. Thermal insulation
   - standard expanded polystyrene EPS
   - elastified expanded polystyrene EPS
4. Anchor
5. Reinforced layer
   - Insulation adhesive ATLAS STOPTER K-20/AVAL KT 85
   - Insulation adhesive ATLAS HOTER U/AVAL KT 55
   - Glass fibre reinforcing mesh
6. Render primer
   - ATLAS CERPLAST/AVAL KT 16 (with mineral render ATLAS CERMIT /AVAL KT 35/AVAL KT 137 and acrylic render ATLAS CERMIT/AVAL KT 60/AVAL KT 64)
   - ATLAS SILKAT ASX/AVAL KT 15 (with silicate render ATLAS SILKAT/AVAL KT 72/AVAL KT 73)
   - ATLAS SILKON ANX/AVAL KT 76 (with silicone render ATLAS SILKON/AVAL KT 74/AVAL KT 75)
7. Render coat
   - Mineral render ATLAS CERMIT /AVAL KT 35/AVAL KT 137
   - Acrylic render ATLAS CERMIT /AVAL KT 60/AVAL KT 64
   - Silicate render ATLAS SILKAT /AVAL KT 72/AVAL KT 73
   - Silicone render ATLAS SILKON /AVAL KT 74/AVAL KT 75
8. Top paint coat (optional)
   - Acrylic paint ATLAS ARKOL E/AVAL KT 44
   - Silicate paint ATLAS ARKOL S/AVAL KT 54 (with primer ATLAS ARKOL SX/AVAL KT 52)
   - Silicone paint ATLAS ARKOL N/AVAL KT 48 and ATLAS FASTEL/AVAL KT 46 (with primer ATLAS ARKOL NX/AVAL KT 47)
   - Silicone paint ATLAS FASTEL-NOVA

Figure 1.Thermal Insulation Composite System ATLAS/AVA [1]

[1] Western Development Commission 2017. Further information can be found at http://www.atlas.com.pl/en

Risk assessments and supports received

EcoSmarts quality assurance documents and system is designed to take into account the technical and economic risks of projects. External insulation requires good weather for installation. This is delayed in poor weather conditions which has associated costs, and may have a backlog which requires sub-contracting / more staff. Cash flow issues are experienced as materials are purchased but are unable to install insulation. EcoSmart use the ATLAS External Thermal Insulation Composite System (ETICS) with render coatings has been given European Technical Approval no. ETA-06/0081 issued in accordance with guidelines of European Technical Approvals ETA 004:2000 and NSAI-Irish Agrément Board Certificate No. 10/0347.

EcoSmart bear the risk of the investment. This is estimated at a minimum of 10% per contract (annual average) and risks are factored into works planning, e.g. if weather is poor, staff are reallocated from external to internal work. This is priced into the work where possible.

Drivers and barriers

The directors of EcoSmart previous worked independent on construction projects using Insulated Concrete Formwork (ICF). Due to changes in the construction industry, they decided to form an alliance and work together and looked at overall renewable energy technologies. Due to the continued downturn in the construction industry in Ireland, they worked in the UK and developed a quality assurance system for use in EcoSmart External Insurance.

The construction sector slowly started to recover in early 2014 with homeowners and businesses investing in building upgrades. The Sustainable Energy Authority of Ireland, reintroduced and increased grants for energy efficiency upgrades to c.€4,500 depending on the scale of energy efficiency measures introduced. They also increased funding for Better Energy Community Scheme which increased demand. EcoSmarts experience in the UK and quality assurance scheme have provided them with the skills to overcome these barriers.

Conditions for the technology transfer, adaptation and new market deployment

As the technology readiness level of ATLAS External Thermal Insulation Composite System (ETICS) is 9 as it is an actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space), there are few preconditions for transferring this technology to other NPA partner regions. EcoSmart have worked in the UK and actively tender for projects in Northern Ireland. As this is a product developed in Poland, it is widely used in Europe.

An increased focus on transitioning to a low carbon society and changes to building regulations and standards will drive the demand for energy efficiency in construction projects, both new projects and retrofitting of older buildings. Supports are available in Ireland for improving building energy ratings (BERs). BERs will become increasingly important factor in the construction industry, particularly in domestic housing.

Project Results

Benefits

Using the ECITS system for external insulation provides a number of energy efficiency benefits. These include:

- Lowers heating cost up to 50%
- Stops condensation and helps prevent mould and fungus growth
- Stops draughts and eliminates cold bridges
- Stabilisation of interior environment
- Wall will act as thermal store (thermal mass)
- More thermally efficient than any other wall system
- U value of 0.15 W/m2K is easy achievable
- Improved aesthetic finish and weather-protecting finishes

Lessons Learnt

The owners of EcoSmart worked together prior to the economic downturn in 2007, and as a result of this, learned many lessons, particularly around diversification from traditional construction methods to a more sustainable methods and incorporating renewable energy and energy efficiency technologies.

EcoSmart learned in 2011 that work which is dependent the availability of grants and funding is unsustainable. The SEAI reduced the funding supports available, which resulted in an increase in applications, and subsequent work which then dramatically reduced leaving the company in a vunerable position.

From this period of growth, recession and growth again, EcoSmart learned the importance of having planning and business development, including putting a robust quality assurance system in place and recruiting specialists to undertake specific roles within the company.

Post Project Benefits

EcoSmarts business has developed since 2013, with a significant amount of the work still dependent on SEAI funding. The SEAI are now developing a 'Sustainable Energy Community' (SEC) Network. The aim of the Network is to support a national movement of SECs operating in every part of the country, and move to a non-grant based sustainable society. SECs can include all the different energy users in the community including homes, sports clubs, community centres, churches and businesses. In 2017, EcoSmart were a partner in a Better Energy Community scheme in their region and are sharing their learning and expertise with communities. This in turn will lead to more sustainable business development of the energy efficiency sector.

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PARTNERS

GREBE will be operated by eight partner organisations across six regions:

WDC