


 www.cost.esf.org European Cooperation in the field of Scientific and Technical Research  
**Building Integration of Solar Thermal Systems – TU1205 – BISTS**

# **COST Action: TU1205**

Building Integration of Solar Thermal  
Systems (BISTS)  
Action Chair: Soteris Kalogirou


 COST is supported by  
the EU RTD Framework Programme


ESF provides the COST Office  
through an EC contract 


 www.cost.esf.org European Cooperation in the field of Scientific and Technical Research  
**Building Integration of Solar Thermal Systems – TU1205 – BISTS**

# **Purpose**

- The purpose of this Mini-Industry Workshop is to present the Action to the local industry and discuss with you ideas and concerns about BISTS.
- Any feedback is welcome....

 COST is supported by  
the EU RTD Framework Programme

ESF provides the COST Office  
through an EC contract 




European Cooperation in the field of Scientific and Technical Research

Building Integration of Solar Thermal Systems – TU1205 – BISTS


## Objectives of Action


- **Main objective:** The creation of a platform from which a working environment is developed that generates methods to study the integration of STS in buildings.
- Development of new novel STS solutions suitable for building integration across three generic European regions.
- Definition of a set of key parameters for the BISTS characterization, taking into consideration the thermal performance, building functionality and aesthetic aspects.



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract






European Cooperation in the field of Scientific and Technical Research

Building Integration of Solar Thermal Systems – TU1205 – BISTS


## Objectives – cont.

- Development of standardised range of methodologies for evaluating BISTS.
- Modelling and simulation of STS (optical and thermal) for different building integration scenarios and for the developed solutions.
- Application of developed STS solutions for building integration including fabrication, characterisation and demonstration of prototypes to the extent that own research funding allows.
- Dissemination of Action activities (symposium, conference, website and various publications).



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract



## Motivation

- **Main Motivation:** The collective concentration of resources and the targeted focusing of scientists who are involved in the design, development and evaluation of solar thermal systems.
  - The Action will foster and accelerate long-term (technological) advancement in STS mainly through critical review, experimentation, simulation and demonstration of viable systems for full incorporation and integration into the traditional building envelope.
- The most important benefit of this Action is the increased adoption of RES/STS in buildings.



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract



## Types of systems to consider


- The Action will cover many forms of solar collecting methodologies with a particular focus on:
  - thermosiphonic units,
  - integrated collector storage units,
  - forced circulation systems,
  - evacuated tube collector systems and
  - various low concentration compound parabolic and Fresnel units.



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract





European Cooperation in the field of Scientific and Technical Research

Building Integration of Solar Thermal Systems – TU1205 – BISTS


## Geographic coverage

- Three generic European regions are considered, to fully explore the Pan-European nature of STS integration:
  - Southern Mediterranean,
  - Central Continental and
  - Northern Maritime Europe.

}


These present distinct characteristics with respect to BISTS as all STS are sensitive to incidence angle effects which are strongly related to the latitude.


- The Action consortium presents a critical mass of European knowledge, expertise, resources, skills and R&D in the area of STS, which should support the creation of innovative ideas and concepts (20+2 countries participating so far).



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract






European Cooperation in the field of Scientific and Technical Research

Building Integration of Solar Thermal Systems – TU1205 – BISTS


## What we mean by Building Integration


- A solar thermal system is considered to be building integrated, if for a building component this is a prerequisite for the integrity of the building's functionality.
- If the building integrated STS is dismantled, dismantling includes or affects the adjacent building component which will have to be replaced partly or totally by a conventional/appropriate building component.
- This applies mostly to the case of structurally bonded modules but applies as well to other cases, like in the case of replacing with BISTS one of the walls in a double wall façade.



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract






European Cooperation in the field of Scientific and Technical Research

Building Integration of Solar Thermal Systems – TU1205 – BISTS


## Benefits of integration


- **Building envelope** – metal, glass or ceramic used in current BISTS roofing designs can last for more than 50 years.
- **Thermal and optical performances** – different systems can deliver different levels of thermal energy to match the varying needs of building occupants.
- **Costs** – Significant savings occur by replacing two separate systems (e.g. wall and collector) with one system that performs both functions.
- **Aesthetics** – mimic the existing appearance of traditional roofing systems and apply **colour collectors** on façades.



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract






European Cooperation in the field of Scientific and Technical Research


Building Integration of Solar Thermal Systems – TU1205 – BISTS


- Therefore BISTS must provide a combination of the following:
  1. Mechanical rigidity and structural integrity.
  2. Weather impact protection from rain, snow, wind and hail.
  3. Energy economy, such as useful thermal energy, but also shading and thermal insulation.
  4. Life expectancy from the various materials involved (at least equal to the life of the building).
  5. Fire protection.
  6. Noise protection.
- Generally a multidisciplinary area involving engineers (mechanical, materials), physicists, architects, etc.



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract






European Cooperation in the field of Scientific and Technical Research

Building Integration of Solar Thermal Systems – TU1205 – BISTS


## Scientific Program

- This COST Action will focus on the coordination of current research undertaken through national programmes in three scientific areas:
  - (1) Development of new innovative methods for building integration of STS;
  - (2) Modelling and simulation of new BISTS and their behaviour as a renewable energy system (RES);
  - (3) Investigation of new applications for innovative integration of STS in various application areas like domestic, commercial and industrial buildings.
- Three Working Groups (WG) will be set up to co-ordinate the research within each theme and a fourth one is dedicated to dissemination activities.



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract






European Cooperation in the field of Scientific and Technical Research

Building Integration of Solar Thermal Systems – TU1205 – BISTS


## Working Groups

- Working Group 1: Development and characterisation of new BISTS
  - WG1 leader Werner Platzer
- Working Group 2: Modelling and Simulation of BISTS
  - WG2 leader Daniel Chemisana
- Working Group 3: Investigation of new applications for innovative BISTS
  - WG3 leader Aggelos Zacharopoulos
- Working Group 4: Dissemination
  - WG4 leader Brian Norton/David Kennedy



COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract



 European Cooperation in the field of Scientific and Technical Research  
www.cost.esf.org **Building Integration of Solar Thermal Systems – TU1205 – BISTS**

## Main purpose of Workshop

- To listen to your ideas
- Get feedback
- Understand the requirements of industry
- Procedure
  - Introduce yourself/industry
  - Open floor for discussion

 COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract 

 European Cooperation in the field of Scientific and Technical Research  
www.cost.esf.org **Building Integration of Solar Thermal Systems – TU1205 – BISTS**

## Thank you very much in advance for your participation and feedback

 COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract 