

Abstract

Climate change is the most serious threat to human society, most ironically of all, one that was brought up by humans themselves. The concentration of greenhouse gases in the atmosphere needs to be cut as soon as possible and, to do this in the most efficient way, it is necessary to act quickly in all the most energy intensive sectors of the world economy.

The highest energy saving and energy efficiency potential is provided by buildings, that account for the largest share of the total European final energy consumption (42%), and greenhouse gas emissions (35%).

Moving towards a low carbon-building sector, and in the context of the new Net Zero Energy Buildings regulations, requires strategies, measures, and technologies to reduce carbon emissions, through all phases of the building life, from design to construction, through operation and maintenance, within the new and existing building stock. The reduction of energy requirement and the mitigation of environmental impacts in the building sector are key targets of energy policies in different countries, to match by means of strategies aimed at enhancing energy efficiency and renewable energy technologies. In such a context Life Cycle Assessment represents a suitable methodology that allows for:

- the assessment of the most effective actions addressed to save energy along the whole building life-cycle.
- the advice for designers and consultants to fulfil the above targets in early design and in retrofit projects, by choosing among different design options.

The seminar aims at discussing these issues with different perspectives on national and international activities.

Rete Italiana LCA

GdL Energia e Tecnologie Sostenibili



57 Annex 57



**Dipartimento di Energia,
Ingegneria dell'Informazione e
Modelli Matematici (DEIM)**

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This seminar is included among the educational activities of the Ph.D. in «Energia e tecnologie dell'informazione» and is worth doctoral credits to students, in accordance to the decisions of the doctorate board.

Seminars, PhD courses

**ENERGIA E TECNOLOGIE DELL'INFORMAZIONE
XXX-XXXI CICLO**

Seminar

“Strategies for a low carbon building sector: international experiences”

Palermo, March 22th 2016 – 9.30

Aula T104

**SCUOLA POLITECNICA
UNIVERSITÀ DI PALERMO
VIALE DELLE SCIENZE ED.9**

**Dipartimento di Energia, Ingegneria dell'Informazione e
Modelli Matematici (DEIM)**

Università degli Studi di Palermo

Scuola Politecnica

Program

9,30 *Registration*

10,00 **Welcome speech**

Prof. Maurizio Carta

President of Scuola Politecnica - University of Palermo

Prof. Luigi Dusonchet

Director of Dipartimento di Energia, Ingegneria dell'Informazione e Modelli Matematici (DEIM) - University of Palermo

Chair:

Prof. Maurizio Cellura

Coordinator of the PhD courses in «Energia e Tecnologie dell'Informazione» - University of Palermo

10,15 “*Evaluation of Embodied Energy and CO_{2eq} for Building Construction – Introduction of Annex 57*”

Prof. Tatsuo Oka

Utsunomiya University, Tochigi, Japan - IEA EBC Annex 57 Operating Agent

10,45 “*Annex 57 Embodied energy and CO_{2eq} Guidelines*”

Dr. Marina Mistretta

PAU Department - University of Reggio Calabria

11,15 “*The CRIM SAFRI project: towards the ELCD network*”

Dr. Francesco Guarino

DEIM Department – University of Palermo

11,45 “*Energy and sustainable technologies: the experience of the Italian LCA network*”

Dr. Sonia Longo¹, Dr. Maria Laura Parisi²

¹ DEIM Department - University of Palermo

²Dipartimento di Biotecnologie, Chimica e Farmacia – University of Siena
Coordinators of the «Energy and sustainable technologies» Workgroup - «Italian LCA Network Association»

12,15 *Debate*

12,45 **Closing speech**

Prof. Maurizio Cellura

Ph.D. course in “ENERGIA E TECNOLOGIE

DELL'INFORMAZIONE”, XXX e XXXI ciclo

Coordinator: Prof. Maurizio Cellura

Ph.D. office: Dipartimento di Energia, Ingegneria

dell'Informazione e Modelli Matematici (DEIM) - Università degli

Studi di Palermo

Duration: 3 years

Curricula:

1.Applied physics and Nuclear Engineering

2.Electric engineering

3.Information technologies and applied sciences

International Energy Agency, Energy in buildings and communities

Annex 57 «Evaluation of Embodied Energy and CO_{2eq} in building construction»

As embodied energy/carbon dioxide occupies large part of the whole energy consumption and carbon dioxide emissions especially in the countries where the building construction activity is enormous, need for evaluation and design reduction of them with scientific basis is increasing among building designer, developers, building material manufacturers and policy decision makers in many countries.

The annex aims:

- 1)To collect existing research results concerning embodied energy and carbon dioxide (CO₂) emissions due to building construction, to analyze them and to summarize into the state of the art;
- 2) To develop guidelines of the methods for evaluating the embodied energy and CO₂ emissions due to building construction;
- 3)To develop guidelines of the measures to design and construct buildings with less embodied energy and CO₂ emissions;
- 4)To develop a project summary report overviewing the technical results of Annex 57

Italian-Maltese research center for environmental sustainability and renewable sources (CRIM – SAFRI)

The project aims to create a research center for environmental sustainability and renewable sources for the Mediterranean area, involving the territories of Sicily and Malta. The Centre supports the local authorities, consortia and networks of small and medium enterprises in the implementation of for Sustainable Consumption and Production (SCP) strategies.

The Centre is set up as an applied research center in the design of innovative solutions compatible with the SCP strategies and aims to ensure the active cooperation with the enterprise for the transfer and development of eco-innovative production technologies and the use of renewable sources; to provide design aid and support of technical-scientific knowledge for technological innovation of products and services with a low environmental impact.

Italian LCA Network Association

The Italian LCA Network Association is a point of reference in Italy for the main stakeholders in the field of Life Cycle Assessment. It works in helping the diffusion of the LCA methodology on a national level and the exchange of experiences. It aims to strengthen and harmonize the assessment tools towards sustainable development and to plan national and international education, information and scientific dissemination. The objective of the «**Energy and sustainable technologies**» workgroup is the study of the LCA performances of energy generation, transformation and use systems, aiming to the promotion of eco-efficiency on any level, following the approach from «cradle» to «grave».