Simone Ferrari[1]

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SIMONE FERRARI, Assistant Professor of Applied Environmental Physics at Dept. ABC - Architecture, Built environment and Construction engineering - of Politecnico di Milano, since 1994 is engaged in teaching and research activities on the energy efficiency of the built environment.
He has participated in over thirty national and international research projects, and he is a member of the EBC - Energy in Buildings and Communities - working group of IEA – International Energy Agency.
He is author more than hundred scientific publications, half of which in the international arena, including the book Building Energy Performance Assessment in Southern Europe. SpringerBriefs in Applied Sciences and Technology (2016).

SCIENTIFIC TRAINING
In 1994 got his master degree in Architecture at the Politecnico di Milano, with a thesis entitled "A 'simulator' as a tool for architectural design: supporting and controlling the energy-environmental performances during the initial stage of the project" (related work was presented at the 49th National Congress ATI - Italian Association of Thermal Engineering" Perugia, Faculty of Engineering, Sept. 1994).
In the same year he started working at the DI.Tec – Dept. of Industrial Design and Architectural Technology (later BEST – Dept. of Building and Environment Science and Technology – now ABC - Dept. of Architecture, Built environment and Construction engineering) of the Politecnico di Milano, in the scientific field of renewable energy, energy saving, advanced technologies and comfort in buildings.
From 1996 to 2001 he also was consultant for the Research Institute “Ambiente Italia s.r.l.” and successfully completed several studies on the energy planning at urban scale and energy audits for buildings retrofit.
From 1998 to 2001 he worked as a Research Fellow at the Politecnico di Milano on the development of tools for the configuration of urban building regulations and standards towards reducing CO_2 emissions.
Since 2001, once assumed the role of Assistant Professor, he promoted and supported the following research and development activities:
2003
- Participated to the works of a group of Chinese researchers hosted at the Politecnico to develop the project SIEEB (Sino - Italy Environment and Energy Building), eco-building designed in cooperation with Tsinghua University, MCA-Mario Cucinella Architects and the China Architecture Design & Research Group. The project involved the use of innovative technologies for the rational use of energy, renewable energy, eco-materials and sustainable use of water (2003-2004);
- Participated in the organization of the Politecnico expo-area within COP9 - 9th World Conference of the Parties-on Climate Change (Milan, 1-12/12/2003);
- Participated in an Integrated Project "Eco-building” of the Sixth Framework Programme coordinated by the Fraunhofer Institute of Stuttgart, preparing a proposal for EU funding for the advanced energy rehabilitation of the students hostel of the Politecnico di Milano "Daniel's Hotel" (The project, called BRITA-in-Pubs, was funded for four years and ended in April 2008).

2004
- Participated in the formulation of a proposal for a co-funding PRIN (Scientific Research Programs of Relevant National Interest) on the project "Strategies and design tools for assessing low-energy building through highly innovative techniques and systems" (project approved by MIUR - Italian Ministry of University and Scientific Research - done and completed in 2006).

2005
- Joined the preparation phase for the Annex46 "EnERGo - Holistic Assessment Tool-kit on Energy Efficient Retrifit Measures for Government Buildings" of the IEA - International Energy Agency - and he was responsible for the Italian contribution to the program, which started in 2006.

2006
- Proposed and developed the research project “Strategies for energy and environmental rehabilitation of the Politecnico di Milano building stock”, completed in December 2007, where he was scientific responsible.

[1] “autorizzo il Politecnico di Milano a pubblicare il presente curriculum sul sito WEB di Ateneo ai fini istituzionali e in ottemperanza al D. Lgs n. 33 del 14 marzo 2013 “Decreto trasparenza” come modificato dal D. Lgs. 97 del 2016”

- Proposed and developed an on-site survey on energy waste in some office spaces of Politecnico, where he was scientific responsible in collaboration with CUEPE - Centre Universitaire d'Etudes des Problèmes de l'Energie - Genève.

2007
- Proposed and implemented a research contract "Correlation thermal transmittance-heat capacity", where he was scientific responsible.
- Proposed and implemented the research contract "Comparative analysis on energy certification procedures" where he was scientific responsible.
- Proposed and activated an agreement for funding a scholarship for the PhD in "Technology and Design for the Built Environment" on optimizing the building-system in relation to adaptive comfort strategies.

2008
- Organized a meeting of the International Working Group of the IEA - ECBCS - Annex 46 at Politecnico di Milano and organized and chaired the Annex international seminar within Expocomfort Milano event (March 12, 2008)
- Activated a collaboration agreement with ENEA - National Agency for New Technologies, Energy and Environment – on "Participation to the International Energy Agency Implementing Agreement - Energy Conservation in Building Communities Systems - and development of simplified computational models for assessing the energy performance of buildings", where he was scientific responsible.

2009
- Extended to Bovisa campus of the Politecnico the research project "Strategies for energy and environmental rehabilitation of the Politecnico di Milano building stock", where he was scientific responsible.
- Renewed the collaboration agreement with ENEA - National Agency for New Technologies, Energy and Environment - on "Participation to the IEA - Implementing Agreement ECBCS" and "Building types, benchmark indices of consumption, application of innovative technologies in different Italian climates", where he was scientific responsible.

2010
- Joined the preparation phase for the Annex56 " Cost Effective Energy and GHG Optimization in Building Renovation " of the IEA - International Energy Agency - and he was responsible for the Politecnico di Milano contribution to the program, which started in 2011.

2011
- Renewed the collaboration agreement with ENEA - National Agency for New Technologies, Energy and Environment - on "Building types, benchmark indices of consumption, application of innovative technologies in different Italian climates: tertiary buildings", where he was scientific responsible
- Proposed and implemented the research contract "Energy and environmental optimization of a foundry" where he was scientific responsible.

2012
- Renewed the collaboration agreement with ENEA - National Agency for New Technologies, Energy and Environment - on "Energy retrofit of tertiary buildings: the target Nearly Zero Energy based on the European Directive 2010/31 - EPBD Recast", where he was scientific responsible.

2013
- Renewed the collaboration agreement with ENEA - National Agency for New Technologies, Energy and Environment - on "Analysis of energy consumptions in the building stock of the Politecnico di Milano" and "Energy Performance Contracts for public institutions: the contents of the procurements", where he was scientific responsible.

2014
- Proposed and activated an agreement for funding a scholarship for the PhD in "Energy and environmental performances of new hemp-lime solutions for building envelope in Italian context" on the prospective diffusion of such natural materials in the building sector.
- Renewed the collaboration agreement with ENEA - National Agency for New Technologies, Energy and Environment - on "Development of methodologies for analysing the energy consumptions of public buildings", where he was scientific responsible.

2015

- Renewed the collaboration agreement with ENEA - National Agency for New Technologies, Energy and Environment - on “Criteria for interventions on cultural heritage’s school building, with protection constraints, toward the nearly Zero Energy Building (nZEB) target”, where he was scientific responsible.

2016
- Joined the preparation phase for the Annex75 "Cost-Effective Building Renovation at District Level Combining Energy Efficiency & Renewables" of the IEA - International Energy Agency - and he is responsible for the Politecnico di Milano – Dept. ABC contribution to the program, which started in November 2017.

2017
- Participated in the formulation of a funding proposal, within the R&D&I Spanish National Plan, of the project MeDoS Mediterranean Double Skin: “Parametric optimization of Double-Skin Façades in a Mediterranean climate to improve energy efficiency under climate change scenarios” (project leader: Higher Technical School of Architecture. University of Seville – Spain). The Spanish Ministry of Economy, Industry and Competitiveness has granted the project in 2018 (on going)

2018
- Organized and chaired the Special Session “Energy efficiency in Cultural Heritage Buildings and Preserved Landscape” within the 13th SDEWES International Conference on Sustainable Development of Energy, Water and Environment Systems, Sept. 30th- Oct. 04th Palermo - Italy.

PARTICIPATION IN RESEARCH AND CONSULTANCY
He has participated in over thirty national research projects. At international level, he has collaborated in the following projects:

1998 “Rehabilitation of old tenement housing in Europe - energy, environment and cost assessment” under the research program SAVE II – DG XVII - Politecnico di Milano, Bauhausunirsität Weimar, JRC Ispra.

1999-2000 “Energy Rehabilitation Methodology For Buildings Located In Urban Areas" funded by the European Commission - SAVE Contract no. XVII/4.1031/Z/97-113.

2000 "Preliminary studies for a zero-energy mitigation of the climatic condition in a outdoor space”, under the European Program ALTENER: "Playing with the sun"

2003-2004 “Study of border condition (climate, regulations, energy sources, etc.) and of the current building types and construction systems. Choice of the most suitable building type and of its position in the plot.” in the frame of the research: "Sino-Italy Environment and Energy Building at Tsinghua University” - funded by the Italian Ministry of Environment, in agreement with the Chinese Ministry of Science and Technology.

2003-2004 “Computer simulations of the energy performance of the selected building type for parametric analyses on the effect of changing different envelope design” in the frame of the research: "Sino-Italy Environment and Energy Building at Tsinghua University” - funded by the Italian Ministry of Environment, in agreement with the Chinese Ministry of Science and Technology.

2004-2008 "Bringing Retrofit Innovation to Application in Public Buildings - BRITA in Pubs" RTD project funded by the EC (VI FP), Integrated Project "Ecobuildings” - European Coordinator: Fraunhofer Institut in Stuttgart - Italian project partners: Politecnico di Milano, ENEA, University of Palermo.

2006 “Feasibility Study for Renewable and Low-energy Applications in Shanghai Building Sector” agreement Ministry of Environment – Dept. BEST Politecnico di Milano – SRIBS Shanghai Institute of Building Sciences

2006 – 2010 “EnERGo - Holistic Assessment Tool-kit on Energy Efficient Retrifit Measures for Government Buildings” Annex46 - Energy Conservation in Buildings and Communities Systems - IEA - International Energy Agency.

2011 - 2017 "Cost-Effective Energy and Carbon Emissions Optimization in Building Renovation" Annex56 - Energy in Buildings and Communities - IEA - International Energy Agency.

2017 (on going) "Cost-Effective Building Renovation at District Level Combining Energy Efficiency & Renewables" Annex75 - Energy in Buildings and Communities - IEA - International Energy Agency.

TEACHING EXPERIENCES

University teaching activities

Since 1994 he has taught several university courses at the Politecnico di Milano, related to the topics of energy and environmental sustainability of the built environment, from the building scale to the urban context, the adoption of the bioclimatic principles in architecture and the use of efficient technologies with low environmental impact.

He has worked in the early years as teaching assistant in many courses (Technical Physics, Applied Environmental Physics and Lighting Engineering) and later as a teacher of several courses (Technical systems in buildings, Energy management of the built environment, Applied Environmental Physics).

As Assistant Professor in 2001, was institutionally assigned to teach the course of Applied Environmental Physics in the Faculty of Architecture and Society of the Politecnico di Milano (from 2010 he teach the course Building Physics in the English section).

He also assumed several additional university courses, i.e. “Application of environmental physics in buildings”, “Implementation of applied environmental physics in the atelier of architectural design”, “Technical solutions for renovating historical buildings” (this last one in the University of Palermo) and proposed and activated the course "Eco-sustainability in architectural design process" for the last year of the Master Degree in Architecture.

He joined the Committee of Teachers for the PhD course “TPQA-Technology and Design of Environmental Quality at the building and urban scale (than called TePAC-Technology and Design for the Built Environment) and later the Committee of Teachers for the PhD course “Design and Technology for the Enhancement of Cultural Heritage”. In these frames, he has been teaching the post-graduated courses such as:

• “Energy in building and systems”
• “Strategies for energy recovery of the built environment”
• “Energy efficiency in architectural design”

He was part of several national university examination boards (entrance exams for PhD students, Research Fellows and Assistant Professors selections).

He has guided a large number of degree theses (first and second university level). In particular, he has been Italian advisor for the thesis: “EIA as a key tool for the achievement of sustainable construction - A comparative study”, for the Master of Science in the University of Bath, Department of Architecture and Civil Engineering - 2010 - Distance Learning in International Construction Management program.

He supervised the following PhD theses:

• “Process and tools for implementing eco-sustainable building design” – PhD on TPQA -Technology and Design of Environmental Quality at the building and urban scale (dissertation 2004)
• “Automation systems to keep down the energy waste in buildings - a tool for planning interventions” PhD on Building Systems and Processes (dissertation 2008)
• “Technology of building systems and variability of environmental conditions: the performance of buildings in the adaptive comfort strategies – PhD on TePAC: Technology and Design for the Built Environment (dissertation 2011)
• “Chinese cities and global warming”- PhD on TePAC: Technology and Design for the Built Environment (dissertation 2011)
• “Characterization of the existing building stocks to assess the effectiveness of large scale energy strategies” - PhD on TePAC: Technology and Design for the Built Environment (dissertation 2012)
• “Estimating the buildings hourly energy demand for Smart Energy District Planning” - PhD on ABC-Architecture, Built environment and Construction engineering. (dissertation 2019)

and supported the research "Application of the adaptive model equation to residential buildings in the South of Spain"- PhD Program in Architecture-University of Seville - during the six-months PhD Student's stay in Politecnico di Milano (Oct. 2016 - Apr 2017).

Extra-university teaching and seminars activities

He lectured in over twenty courses and seminars organized in Italy by national professional associations, master schools, governmental and private associations, etc.

Abroad he carried out the following lessons:

• In May '99 hold a seminar on "Energy Audit of Buildings” at the Academy of Architecture of Mendrisio (CH) in the “Energy and Environment Course”.
• In February '05 hold a seminar on "Energy efficiency and comfort in architecture" for post-graduate students at the Universidad de Brasilia - Facultad de Arquitetura and Urbanismo, Brazil.
• In April '07 hold a seminar on "Energy Saving Potential in Italian buildings: beyond the standards" in the frame of the "Cycle de Formation Énergie – Environnement: Conférence-Débat" at the Université de Genève - Centre Universitaire d'Etude de Problèmes de l'Energie (CH)
• In March '07, in January 2010 and in January 2012 hold seminars on "Health and comfort of living" under the "Program of Continuing Education" at the SUPSI – Switzerland University of Applied Sciences - Department of Environment, Construction and Design - Institute Sustainability Applied Built Environment - Lugano (CH)