

Beyond NZEB buildings

Oltre gli edifici NZEB

Matera Italy

May 10th • 11th, 2017



Patronages



REGIONE BASILICATA



BEYOND NZEB BUILDINGS. DIAGNOSIS, REQUALIFICATION, HVAC SYSTEMS, CONTROLS, REGULATION AND ECONOMICAL EVALUATION

Palazzo Viceconte—Via San Potito 7 Matera— 9.00 a.m.

As requested by the European Directive 31/2010, important measures are needed to increase the number of buildings which not only fulfill current minimum energy performance requirements, but are also more energy efficient, thereby reducing both energy consumption and carbon dioxide emissions.

For this purpose European countries have been requested to draw up national plans for increasing the number of nearly zero-energy buildings and regularly report such plans to the Commission.

The achievement of NZEB targets requires a wide range of technologies, systems and solutions with different degrees of complexity and sophistication, depending on the location and environment conditions, but also on local legislation and market situation. In particular, for mediterranean climate conditions, how can the nZEB design challenge be summarized?

A careful building planning permits to obtain indoor comfort conditions both in winter and summer with very low energy consumptions, but an important role is played by heating and air-conditioning installations, by the application of energy from renewable sources, by the passive heating and cooling elements, shading, by the thermal comfort and the indoor air quality with adequate natural light and satisfactory indoor noise level.



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May, 10th 2017 — PRELIMINARY PROGRAMME

9,00 a.m. Participants registration

10,00 a.m. **Opening Ceremony and Plenary Session**

Welcome addresses

Francesca R. d'Ambrosio, *AiCARR President*

Raffaello De Ruggieri, *Mayor of Matera*

Aurelia Sole, *President of Matera 2019 Foundation, Dean of University of Basilicata*

11,00a.m. **General introductory speeches:**

Livio de Santoli, *President of Scientific Committee*

11,30a.m. Stefano P. Corgnati, *REHVA President*

11,45a.m. Bjarne Olesen, *ASHRAE President-elect*

Lecture:

12,00p.m. **The italian strategy on NZEB buildings**

Carminé Marinucci, *ENEA Roma*

12,40p.m. **REHVA Award for design**

1,00 p.m. **Lunch**

2,30 p.m. **Technical simultaneous sessions**

4,00 p.m. **Break**

4,15 p.m. **Technical simultaneous sessions**

Lecture:

5,30 p.m. **Long term investments for the transition to energy efficiency**

Franco Bassanini, *President of ASTRD Foundation*

6,00 p.m. **Closure of the day's work**

7,30 p.m. **Welcome Cocktail**

May, 11th 2017 — PRELIMINARY PROGRAMME

8,00 a.m. Participants registration

9,00 a.m. **Technical simultaneous sessions**

10,15 a.m. **Break**

10,30 a.m. **Technical simultaneous sessions**

1,00 p.m. **Lunch**

2,30 p.m. **Workshop: Commissioning (Sala Grande)**
AiCARR, ASHRAE, CIBSE

2,30 p.m. **Workshop: Working Group NZEB (Sala della Musica)**
REHVA—AiCARR

4,15 p.m. **Technical visits**

TECHNICAL SESSION 1 SALA GRANDE

New buildings in the mediterranean climate

Chairman: Paolo Baggio, Dip. Di Ingegneria Civ. amb. e mecc., Università di Trento

2,30 p.m. Air cooled heat pump coupled with Horizontal Air-Ground Heat Exchanger (HAGHE) for Zero Energy Buildings in the Mediterranean climate

Cristina Baglivo, Paolo Maria Congedo, Domenico Laforgia, *Department of Engineering for Innovation, University of Salento, Lecce*

2,45 p.m. New strategies towards nearly zero energy in existing buildings: the ABRACADABRA project

Giovanni Semprini, *Department of Industrial Engineering, School of Engineering and Architecture, University of Bologna*
Annarita Ferrante, Elena Cattani, Anastasia Fotopoulou, *Department of Architecture, School of Engineering and Architecture, University of Bologna*

3,00 p.m. Radiation protection considerations on radon and building materials radioactivity in near Zero Energy Buildings

Giada Gandolfo, Luigi Lepore - Andrea Pepperosa - Romolo Remetti, *Department of Basic and Applied Sciences for Engineering, SAPIENZA Università di Roma*
Daniele Franci, *Regional Environmental Protection Agency, Roma*

3,15 p.m. Obtaining a NZEB in mediterranean climate by using only on site renewable energy: is it a realistic goal?

Diana D'Agostino, Concetta Marino, Francesco Minichiello, *Dipartimento di ingegneria Industriale, Università di Napoli Federico II*
Francesco Russo, *Dipartimento di Ingegneria, Università del Sannio, Benevento*

3,30 p.m. Analytical modelling of breathing walls: experimental verification by means of the dual air vented thermal box lab facility

Andrea Alongi, Adriana Angelotti, Livio Mazzarella, *Dipartimento Energia, Politecnico di Milano*

3,45 p.m. Insights into the effects of occupant behavior lifestyles and building automation on building energy use

Valentina Fabi, Verena Marie Barthelmes, Stefano P. Corngati, *Department of Energy, Polytechnic of Turin*

TECHNICAL SESSION 1 SALA DELLA MUSICA

The existing buildings: audit and restoration

Chairman: Manuel Gameiro da Silva, Department of Mechanical Engineering, University of Coimbra, Coimbra, Portugal

2,30 p.m. Problems for the upgrading nZEB of public buildings in Zone B: case study of a primary school in Catania

Giuliano Cammarata, Massimiliano Cammarata, Marco Caponnetto, *Liberi Professionisti, Catania*

2,45 p.m. Criteria and structure of harmonized data collection for NZEB retrofit buildings in Europe

Delia D'Agostino, Barbara Cuniberti, Isabella Maschio, *Joint Research Centre, European Commission, Ispra, Varese*

3,00 p.m. Façade retrofitting: from energy efficiency to climate change mitigation

Paola Lassandro, Silvia Di Turi, *Construction Technologies Institute, Italian National Research Council, ITC-CNR - Bari*

3,15 p.m. NZEB target for existing buildings: case study of historical educational building in mediterranean climate

Fabrizio Ascione, *DII - Department of Industrial Engineering, University of Napoli Federico II, Napoli*
Rosa Francesca De Masi, Filippo De Rossi, Silvia Ruggiero, *DING, Department of Engineering, University of Sannio - Benevento*
Giuseppe Peter Vanoli, *Department of Medicine and Health Sciences -Vincenzo Tiberio, University of Molise - Campobasso*

3,30 p.m. Effect of louvers shading devices on visual comfort and energy demand of an office building. A case of study

Francisco Fernandez Hernandez, José Miguel PenacSuarez, Mari Carmen Gonzalez Muriano, Simon Carrillo Rueda, *Altra Corporación Empresarial - Málaga, Spain*
José Manuel Cejdo Lopez, *Energy Research Group, ETSII-University of Málaga, Spain*

3,45 p.m. NZEB, cost and comfort optimal retrofit solutions for an italian reference Hotel

Tiziana Buso, Cristina Becchio, Stefano P. Corngati, *TEBE Research Group, Department of Energy, Politecnico di Torino*

TECHNICAL SESSION 1 SALA DEI TAROCCHI

Energy metering and BACS

Chairman: Mauro Strada, Steam srl, Padova

2,30 p.m. Balancing system and control of differential pressure in hydraulic systems: a step towards energy saving and comfort

Roberto Torreggiani, Alberto Montibelli, *Giacomini spa, San Maurizio D'Opaglio, Novara*

2,45 p.m. Eco-efficient sustations

Paolo Arrus, Daniele Davide Del Boca, Marco Rosa Brusin, *Giacomini spa, San Maurizio D'Opaglio, Novara*

3,00 p.m. Building monitoring system in a large social housing intervention in northern Italy

Marco Filippi, Elisa Sirombo, *Department of Energy, Politecnico di Torino*
Antonio Catalano, *Delta Controls Italy s.r.l. - Milan*
Andrea Sica, *InvestiRE SGR spa - Milan*

3,15 p.m. Application of a technological system of monitoring and continuous analysis of energy efficiency data, in the sector of large multi-purpose buildings, for energy diagnosis and design renovation

Alberto Lodi, *EGE Industry UNI CEI 11339, Milan*
Roberto Salimbeni, *BlackBox Green (BBG), Modena*
Sergio Alabiso, *BlackBox Green (BBG), Lodi*

3,30 p.m. Development and experimental validation of a model for energy recovery

Marco Tarantini, *Freelance Engineer, Consultant of "National Energy Technology Cluster (Di.T.N.E.)", Lecce*
Domenico Laforgia, *Professor of "Macchine I, Macchine II ed energetica" in "Università del Salento"; previous Rector of "Università del Salento", Lecce*

3,45 p.m. From the experience to the design, from the selection to the maintenance: an ideal air conditioning approach to help a building to achieve nearly zero energy

Luigi de Rossi, Giacomo Favaro, Chiara Tisato, *Mitsubishi Electric Hydronics and IT cooling System spa, Treviso*

TECHNICAL SESSION 2 SALA GRANDE

New buildings in mediterranean climate

Chairman: Vincenzo Corrado, Dip. Di Energia, Politecnico di Torino

4,15 p.m. Trade-off between sound insulation performance and cost optimality in a residential NZEB

Jean-Christophe Vallée, *Ecole Normale Supérieure Paris-Saclay, France* - DENERG, TEBE Research Group, Politecnico di Torino

Maria Ferrara, Arianna Astolfi, Enrico Fabrizio, DENERG, TEBE Research Group, Politecnico di Torino

4,30 p.m. Hydrocarbons solution for the house conditioning

Marco Rosa Brusin, *Giacomini spa, San Maurizio D'Opaglio, Novara*

4,45 p.m. A high performance home in the mediterranean climate: from the design principles to actual measurements

Francesco Causone, Marco Pietrobon, Lorenzo Pagliano, Silvia Erba, *Dipartimento di Energia, Politecnico di Milano*

5,00 p.m. Study of innovative solutions of the building envelope for passive houses in mediterranean areas

Natale Arcuri, Roberto Bruno, Cristina Carpino, *Department of Mechanical, Energetic and Management Engineering (DIMEG) – University of Calabria*

TECHNICAL SESSION 2 SALA DELLA MUSICA

The existing buildings: audit and restoration

Chairman: Livio Mazzarella, Dip. Di Energia, Politecnico di Milano

4,15 p.m. NZEB supermarkets: energy optimization in the food cold storages

Michele Vio, *Engineer, AiCARR Past President, Venice*

4,30 p.m. Integrated smart system for energy audit: methodology and application

Lorenzo Belussi, Ludovico Danza, Francesco Salamone, Italo Meroni, *ITC-CNR, Construction Technologies Institute - Italian National Research Council, San Giuliano Milanese, Milano*
Stefano Galli, Sandra Dei Svaldi, *ICIE-Cooperative Institute for Innovation, Applied Research and Technology Transfer, Bologna*

4,45 p.m. Energy saving concept development for the more-connect pilot energy renovation of apartment blocks in Denmark

Ove Christen Mørck, *Cenergia, Kuben Management, Copenhagen, Denmark*

5,00 p.m. Criticalities in the NZEB retrofit of scholastic buildings: analysis of a secondary school in centre Italy

Daniele Testi, Michele Rocca, Elena Menchetti, Simona Comelato, *Department of Energy, Systems, Territory and Constructions Engineering (DESTEC), University of Pisa*

5,15 p.m. Influence of comfort expectations on building energy need

Francesco Madonna, *Energy System Development Department, RSE SpA Ricerca sul Sistema Energetico*
Pietro Quaglia, *Energy System Development Department, RSE spa Ricerca sul Sistema Energetico – Department of Energy, Politecnico di Milano*
Vincenzo Corrado, *Department of Energy, Politecnico di Torino*

TECHNICAL SESSION 2 SALA DEI TAROCCHI

Use of renewables

Chairman: Nicola Cardinale, Università degli Studi della Basilicata

4,15 p.m. Dual source solar assisted heat pump model development, validation and comparison to conventional systems

Pietro Quaglia, *RSE spa Ricerca sul Sistema Energetico – Department of Energy, Politecnico di Milano*
Lorenzo Croci, *RSE spa Ricerca sul Sistema Energetico*
Luca Molinaroli, *Department of Energy, Politecnico di Milano*

4,30 p.m. On the optimal mix between acid lead battery and thermal storage tank for pv and heat pump systems in high performance buildings

Alessandro Prada, Elena Bee, Maurizio Grigante, Paolo Baggio, *Department of Civil Environmental and Mechanical Engineering, University of Trento*

4,45 p.m. Modeling and performance evaluation of a cogeneration power plant based on a water source heat pump combined with hybrid thermal photovoltaic solar panels

Iosto Casula, Alessandro Tonzar, *Termovoltaica srl – technoAREA Gorizia*

5,00 p.m. Hydrogen technologies in modern buildings

Samuele Molina, *Giacomini spa – San Maurizio d'Opaglio, Novara*

5,15 p.m. Performance evaluation of a building integrated photovoltaic (BIPV) system combined with a wastewater source heat pump (WWSHP) system

Mustafa Araz, Arif Hepbasli, Emrah Biyik, *Department of Energy Systems Engineering, Faculty of Engineering, Yasar University, Turkey*
Mehdi Shahrestani, Runming Yao, Emmanuel Essah, Li Shao, *School of Construction Management and Engineering, The University of Reading, UK*
Armando C. Oliveira, *Mechanical Engineering Department – FEUP, University of Porto, Portugal*
Orhan Ekren, *Solar Energy Institute, Ege University, Turkey*
Huseyin Gunerhan, *Department of Mechanical Engineering, Ege University, Turkey*

TECHNICAL SESSION 3 SALA GRANDE

New buildings in mediterranean climate

Chairman: Valentina Serra, Dipartimento di Energia, Politecnico di Torino

9,00 a.m. **Occupant behavior lifestyles and effects on building energy use: investigation on high and low performing features**

Verena Marie Barthelmes, Valentina Fabi, Cristina Becchio, Stefano P. Corgnati, *Department of Energy, Polytechnic of Turin*

9,15 a.m. **Impact and reliability of EPCs in the real estate market**

Ramon Pascual, Giulia Paoletti, Roberto Lollini, *Institute of Renewable Energy of European Academy of Bolzano, EURAC Research – Bolzano*

9,30 a.m. **Towards NZEB by optimizing HVAC system configuration in different climates**

Cristina Becchio, Stefano P. Corgnati, Giulia Crespi, *DENERG, Politecnico di Torino – Torino*
Michele Vio, *RHOSS Consultant – Arquà Polesine, Rovigo*

Leonardo Prendin, Micaela Ranieri, *RHOSS, Gruppo IRSAP – Arquà Polesine, Rovigo*

9,45 a.m. **Energy refurbishment in existing buildings: thermal bridge correction according to DM 26/6/15 limit values**

Stefano Bergero, Anna Chiari, *DAD - Department of Architecture and Design, Polytechnic School, University of Genova*
Paolo Cavalletti, *DIME - Department of Mechanical Engineering, Polytechnic School, University of Genova*

10,00 a.m. **From high energy demands to NZEB: the retrofit of a school in Catalonia, Spain**

Umberto Berardi, Mauro Manca, *Department of Architectural Science, Ryerson University, Toronto, Canada*

Pau Casaldiga, Felipe Pich-Aguilera, *Pich-Aguilera Architects, Barcelona, Spain*

TECHNICAL SESSION 3 SALA DELLA MUSICA

The existing buildings: audit and restoration

Chairman: : Stefano P. Corgnati, Dip. Energia, Politecnico di Torino

9,00 a.m. **Proposal of a methodology for achieving a LEED O+M certification in historic building**

Elena Mazzola, Tiziano Dalla Mora, Fabio Peron, Piercarlo Romagnoni, *Department of Design and Planning in Complex Environments, University IUAV of Venice*

9,15 a.m. **Cost optimal measures for renovation of existing school buildings towards NZEB**

Tiziano Dalla Mora, Fabio Peron, Alessandro Righi, Piercarlo Romagnoni, *University IUAV of Venice*

9,30 a.m. **Application of an integrated design methodology for regenerative process of the existing buildings**

Renato Morbiducci, Clara Vite, *Department of Architecture and Design, Polytechnic School, University of Genoa*

9,45 a.m. **Cost-optimal approach to transfer the public buildings into NZEBs: an European cross country comparison**

Simona Paduos, Vincenzo Corrado, *Department of Energy, Polytechnic of Turin*

10,00 a.m. **A new procedure of energy audit and cost analysis for the transformation of a school into a nearly zero energy building**

Vincenzo Corrado, Ilaria Ballarini, Simona Paduos, Lidia Tulipano, *Department of Energy, Polytechnic of Turin*

TECHNICAL SESSION 3 SALA DEI TAROCCHI

HVAC system technologies

Chairman: : Gerhard Zweifel, University of Lucerna, Svizzera

9,00 a.m. **Modeling and control of a free cooling system for data centers**

Alessandro Beghi, Michele Lionello, Mirco Rampazzo, *Department of Information Engineering, University of Padova*
Luca Cecchinato, Enrico Sisti, *Everbyte s.r.l, Padova*
Giuseppe Dalla Mana, Vertiv, *Piove di Sacco, Padova*

9,15 a.m. **Experimental investigations on evaporative condensers performance**

Maria Fiorentino, *Decsa srl, Voghera, Pavia*
Giuseppe Starace, *Department of Engineering for Innovation-University of Salento, Lecce*

9,30 a.m. **Indirect evaporative cooling systems: an experimental analysis in summer conditions**

Stefano De Antonellis, Cesare Maria Joppolo, Samanta Milani, *Dipartimento di Energia, Politecnico di Milano*
Calogero Leone, Paolo Liberati, *Recuperator spa*

9,45 a.m. **Saving resources by going evaporative: how evaporative cooling technologies and water cooled chillers can significantly reduce energy demands**

Francesco Scuderi, *Eurovent association, France*
Maria Elena Proietti, *Assoclima, Milano*
Nicola De Cardenas, *Decsa srl*
Alessandro Fontana, *M.i.t.a. srl*
Philip Montrasio, *Evapco Europe srl*
Antonio Visintini, *Balticare srl*

10,00 a.m. **Indirect evaporative cooling systems: modeling and performance analysis**

Paolo Liberti, Calogero Leone, Yakub Bawa, *Recuperator SpA – Rescaldina, MI*
Stefano De Antonellis, Cesare Maria Joppolo, *Dipartimento di Energia, Politecnico di Milano*

TECHNICAL SESSION 4 SALA GRAND NZEB and sustainability

Chairman: Piercarlo Romagnoni, Università di Venezia, IUAV

10,30 a.m. **The problems connected with the achievement of NZEB qualification for advanced tertiary buildings: guidelines and case studies**
Matteo Bo, Giorgio Bo, Francesco Mantua, *Prodim srl, Turin*

10,45 a.m. **Sustainable NZEB building in mediterranean area**
Francesco Masciarelli, *Free-lance Professional, Perugia*

11,00 a.m. **Thermal and mechanical characterization of panels made by cement mortar and sheep's wool fibres**
Tiziana Cardinale, Giuseppe Arleo, Franco Bernardo, Andrea Feo, Piero De Fazio, *ENEA - Centro Ricerche Enea-Rotondella, Matera*

11,15 **Presentation: Supervised certification of Commissioning process of HVAC equipment**
Erick Melquiond, *Eurovent Certita Certification, France*

TECHNICAL SESSION 4 SALA DELLA MUSICA

Quality of indoor environment

Chairman: Ioan Silviu Dobosi, Dosetimpex srl, Universitatea Politehnica Din Timsoara, Romania

10,30 a.m. **The influence of daylighting in buildings with parameters NZEB: application to the case study for an office in Tuscany mediterranean area**
Cristina Carletti, Gianfranco Cellai, Leone Pierangioli, Fabio Sciarpi, Simone Secchi, *Department of Industrial Engineering, University of Florence*

10,45 a.m. **How to control the indoor environmental quality through the use of the do-it-yourself approach and new pervasive technologies**
Francesco Salamone, Lorenzo Belussi, Ludovico Danza, Matteo Ghellere, Italo Meroni, *ITC-CNR, Construction Technologies Institute - Italian National Research Council, San Giuliano Milanese, Milan*

11,00 a.m. **Energy saving potential with a double skin roof ventilated by natural convection in Djibouti**
Abdou Idris Omar, *Université de Lyon, CNRS, Université Lyon 1, Villeurbanne, France—Université de Djibouti, Faculté d'Ingénieurs, GRE, Djibouti*
Joseph Virgone, Etienne Vergnault, Damien David, Abdou Idris Omar, *Université de Lyon, CNRS, Université Lyon 1, Villeurbanne, France*
Abdoulkader Ibrahim idris, *Université de Djibouti, Faculté d'Ingénieurs, GRE, Djibouti*

11,15 a.m. **An adaptive dynamic neural network for thermal characterization of building components**
Roberto Baccoli, Lorenza Di Pilla, Andrea Frottolillo, Costantino Carlo Mastino, *Department of Civil, Environmental Engineering, and Architecture, University of Cagliari*

TECHNICAL SESSION 4 SALA DEI TAROCCHI

Cases study

Chairman: Cesaare Maria Joppolo, Dipartimento Energia, Politecnico di Milano

10,30 a.m. **Life cycle energy performances of a Net zero energy prefabricated building in Sicily**
Giovanni Tumminia, Francesco Guarino, Sonia Longo, Maurizio Cellura, *DEIM department University of Palermo*
Marina Mistretta, *PAU Department, University of Reggio Calabria*
Davide Aloisio, Vincenzo Antonucci, *Institute for Advanced Energy Technologies "Nicola Giordano" - Italian National Research Council, Messina*

10,45 a.m. **Retrofitting under protection constraints according to the nearly zero energy buildings (NZEB) target: the case of an italian cultural heritage's school building**
Simone Ferrari, *Department of Architecture, Built environment and Construction engineering (ABCE), Politecnico di Milano*
Carlo Romeo, *Department UTEE-REDI, ENEA, Casaccia Research Center, Roma*

11,00 a.m. **Radiant ceiling in Hospitals—The case history of the "Hospital De Mollet" in Spain**
Sergio Espineira, *Giacomini SL, Spain*

11,15 a.m. **HVAC systems with variable primary flow: analysis on energy potential saving**
Michele Vio, *Rhoss - Irsap Group consultant*
Luca Germano, Michele Babuin, *Rhoss spa - Codroipo, Udine*

50th International Conference May 10th-11th

CONFERENCE FEES

The registration fee includes Entrance to the Scientific Meeting and business Lunch

Participants	Early bird within April 10 th , 2017	After April 10 th , 2017
AiCARR, AICVF, ATECYR, TTMD Members	400,00	500,00
ASHRAE, IIR, REHVA Members	450,00	550,00
Non Members	550,00	650,00
AiCARR AICVF, ATECYR, TTMD Members (free papers)	350,00	450,00
ASHRAE, IIR, REHVA Members (free papers)	400,00	500,00
Speakers non Members (free papers)	500,00	600,00
AiCARR AICVF, ATECYR, TTMD Students members (max 30 years old)	50,00	80,00
Students non members (max 30 years old)	100,00	150,00
Accompanying persons (not included the entrance to the scientific meeting)	200,00	300,00
Gala Dinner	80,00	80,00

50th International Conference + Climamed 2017

May, 10-11-12-13

CONFERENCE FEES

The registration fee includes Entrance to the Scientific Meeting and business Lunch

Participants	Early bird within April 10 th , 2017	After April 10 th , 2017
AiCARR, AICVF, ATECYR, TTMD Members	650,00	750,00
ASHRAE, IIR, REHVA Members	700,00	800,00
Non Members	800,00	900,00
AiCARR AICVF, ATECYR, TTMD Members (free papers)	600,00	700,00
ASHRAE, IIR, REHVA Members (free papers)	650,00	750,00
Speakers non Members (free papers)	750,00	850,00
AiCARR AICVF, ATECYR, TTMD Students members (max 30 years old)	80,00	120,00
Students non members (max 30 years old)	180,00	240,00
Accompanying persons (not included the entrance to the scientific meeting)	250,00	350,00
Gala Dinner	80,00	80,00