

PED
SEAUNIVERSITÀ
DEGLI STUDI
DI PALERMOdipartimento
di ingegneria
unipaCentro di Sostenibilità e
Transizione Ecologica

EBC

Energy in Building and
Communities Programme

IV International Energy Agency Energy in Buildings and Communities Annex 83 PhD Summer school

“Understanding Positive Energy Districts: Case-Studies Analyses for Replication”

June 16-20, 2025

University of Palermo (UNIPA), Palermo, Italy

Course Overview and Institutional Framework

The IV International PhD Summer School is organized by the Department of Engineering at the University of Palermo, in collaboration with the International Energy Agency Energy in Buildings and Communities Programme (IEA EBC) Annex 83 and supported by the University's Centre for Sustainability and Ecological Transition. The course will take place from June 16 to 20, 2025, in Palermo, Italy, and offers an intensive, multidisciplinary program focusing on the principles and implementation of Positive Energy Districts (PEDs). Through a balanced integration of lectures, interactive workshops, and case study analyses, participants will explore the technological, urban, and policy dimensions of PEDs. The initiative brings together international experts and young researchers to foster knowledge exchange and develop replicable methodologies for sustainable urban transformation. The program welcomes PhD candidates from various disciplines, aiming to build capacity in the field of integrated energy planning and sustainable urban development.

Introduction

The IV IEA EBC Annex 83 PhD Summer School offers an intensive and interdisciplinary educational experience aimed at equipping PhD candidates with advanced knowledge and practical tools to engage with the emerging field of Positive Energy Districts (PEDs). As a critical component of sustainable urban development, PEDs are driven by the urgent need to decarbonize cities and enhance energy efficiency through innovative technologies and integrated planning strategies. They bring together renewable energy production, efficient energy use, and sustainable urban design to reduce greenhouse gas emissions and foster resilient urban environments.

Despite the growing international attention to PEDs, there remains a pressing need for the development of replicable methodologies, the critical assessment of real-world case studies, and collaborative learning environments capable of supporting the successful adoption and scalability of PED concepts across diverse socio-economic and climatic contexts.

Over the course of five days, the Summer School integrates theoretical lectures by international experts with interactive workshops, group discussions, and collaborative sessions centred on case study analysis. The curriculum is organized around key thematic areas, including the fundamentals of PEDs, policy and urban planning frameworks, and practical applications from a multidisciplinary perspective. Participants will be encouraged to engage critically with the material and to contribute actively to peer learning and knowledge exchange. The program will conclude with a final plenary session, during which participants will present group findings, receive expert feedback, and reflect on future directions for PED replication and innovation, promoting both academic growth and international collaboration.

Methodology

The Summer School adopts a blended and multidisciplinary educational approach, combining seminar-style lectures, case-study analysis, co-creation activities, and hands-on workshops. The program is structured into thematic modules and led by international experts from the IEA EBC Annex 83 network and faculty members from the University of Palermo, offering participants a structured pathway to explore the methodological,

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technological, and policy dimensions of Positive Energy Districts (PEDs).

Lectures will introduce the conceptual foundations and strategic relevance of PEDs in advancing sustainable urban development and energy transition. Case-study sessions will examine real-world implementations in diverse geographical, political, and socio-economic contexts, allowing participants to assess different urban planning strategies and technological solutions, while critically reflecting on challenges and opportunities for replication.

From Monday to Thursday, the program will feature a combination of frontal teaching, poster presentations by the participants, collaborative group work, and co-creation laboratories. These activities are designed to foster peer learning, encourage interdisciplinary exchange, and deepen the understanding of PED-related issues through direct engagement. On Friday, the Summer School will culminate in thematic workshops and roundtable discussions, offering a platform for synthesis, expert feedback, and critical debate.

Throughout the week, the pedagogical structure promotes active participation and guided interaction, ensuring a balance between theoretical instruction and practical application. The final plenary session will provide an opportunity for participants to present the outcomes of their collaborative work and to engage in shared reflection on the development of scalable and context-sensitive strategies for Positive Energy Districts.

Professional Opportunities

By engaging with cutting-edge topics such as energy transition, sustainable urban planning, and the integration of innovative technologies, the program fosters the acquisition of interdisciplinary competencies that are increasingly sought after in both academic and professional contexts. The knowledge and skills developed throughout the program will support career pathways in environmental consultancy firms, engineering and architecture practices, as well as public and private institutions involved in energy infrastructure management and territorial planning.

Moreover, through direct interaction with international experts and the practical experience gained in workshops and roundtable sessions, the Summer School offers a privileged gateway to international collaborations in the fields of smart cities, renewable energy, and sustainable construction.

Language

All activities, lectures, and discussions of the Summer School will be conducted in English. A good grasp of spoken and written English is therefore required.

Target Group and Admission Requirements

The Summer School is primarily intended for PhD students, master's students, and recent doctoral graduates whose academic background aligns with the thematic scope of the course. While naturally rooted in the disciplinary domain of Environmental Technical Physics (Italian SSD: ING-IND/11), the program is also open to applicants from fields such as Building Engineering and Architecture, Urban Planning, and Environmental Engineering.

Participants should be currently enrolled in a relevant master's or doctoral program, or have recently (1 year maximum) completed such studies. Other candidates might be considered but priority will be given to eligible candidates.

All candidates must demonstrate a clear academic or professional engagement with topics related to Positive Energy Districts (PEDs), as evidenced in their curriculum vitae.

Applications will be evaluated based on the following criteria:

- Relevance and coherence of the candidate's academic background with the thematic focus of the Summer

School;

- Demonstrated experience or research activity related to PEDs, as evidenced in the CV.

The number of admitted participants will range between a minimum of 15 and a maximum of 35. At least 50% of the available places will be reserved for applicants who have obtained their academic degrees from universities other than the University of Palermo, including both national and international institutions.

General Information

The Summer School will be held over the course of one week, from June 16 to 20, 2025. Activities will take place at the Conference Hall of the Botanical Garden of Palermo (Orto Botanico di Palermo), University of Palermo, located at Via Lincoln, 2 – 90133 Palermo, Italy. This location will host the full range of academic sessions, practical workshops, and collaborative activities.

The school is developed within the framework of the Rome Technopole project and approved by the University of Palermo (*Senato accademico: Prot. 50030-25/03/2025, Rep Delibere Senato accademico n.141/2025 - seduta del 25 marzo 2025; Consiglio di amministrazione: Prot. 52264-28/03/2025 - Rep. Delibere Consiglio di amministrazione n.418/2025 - seduta del 27 marzo 2025, Consiglio di Dipartimento di Ingegneria: Prot. 27400 - 19/02/2025 - Rep. Delibere Consiglio Dip. Ingegneria n.45/2025 seduta del 18 Febbraio 2025*).

Certificate and Academic Credits

Participants who regularly attend the program and actively take part in all scheduled activities will receive an official certificate of participation issued by the University of Palermo.

No ECTS credits or equivalent academic credits are foreseen for this edition of the Summer School.

Application Procedure

To apply for the Summer School, candidates are required to complete the online application process by filling out the official application form available at the following link:

https://docs.google.com/forms/d/e/1FAIpQLSdcVrnRlqvT_JLacsRLYcjik_c7SoLiNEiL9iq7Rr3kQNGcSw/viewform?usp=header

The application form must be completed in its entirety and submitted exclusively through the online platform. Email submissions will not be accepted.

During the online application, candidates will be asked to upload the following mandatory documents:

1. Curriculum Vitae (CV) indicating also the highest education degree completed and the final grade.
2. A degree certificate indicating the final graduation mark, or a self-declaration where applicable.

All documents must be uploaded in the formats and size limits specified within the form (PDF, JPG, PNG, max 10MB per file). Incomplete applications or submissions received after the deadline will not be considered.

The **deadline for application is May 8, 2025, at 12:00 PM (CET)**. No participation fee is required. Please note that scholarships or financial support are **not** available for this edition of the Summer School.

Organization

Scientific Director: Prof. Francesco Guarino francesco.guarino@unipa.it

Organizational Committee: Francesco Guarino, Maurizio Cellura, Sonia Longo, Roberta Rincione, Lorenzo Ilardi, Lorenza Di Pilla, Saghar Hosseinalizadeh, Alberto Brunetti, Emilio Sessa, Alberto Affranchi.

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Center for Sustainability and Ecological Transition (CSTE) - University of Palermo
www.unipa.it/centri/cste

IEA EBC Annex 83 - Positive Energy Districts
<https://annex83.iea-ebc.org>

Scientific committee

The full list of faculty members and their respective areas of expertise is provided below:

- **Adriano Bisello**, Senior Researcher, EURAC Research;
- **Caroline Hachem-Vermette**, Associate Professor, Concordia University;
- **Codrut Papina**, Urban Planner and Senior Consultant, Urbasofia;
- **Federico Butera**, Professor Emeritus, Polytechnic University of Milan;
- **Francesco Guarino**, Associate Professor, University of Palermo;
- **Francesco Reda**, Senior Researcher, VTT Technical Research Centre of Finland;
- **Ilaria Montella**, Assistant Professor, Roma Tre University;
- **Maurizio Cellura**, Full Professor, University of Palermo;
- **Michele Zinzi**, Senior Researcher, ENEA;
- **Paola Marrone**, Associate Professor, Roma Tre University;
- **Paolo Civiero**, Associate Professor, Roma Tre University;
- **Rosaria Volpe**, Assistant Professor, University of Catania;
- **Sonia Longo**, Associate Professor, University of Palermo;
- **Ursula Eicker**, Full Professor and Canada Excellence Research Chair, Concordia University;
- **Xingxing Zhang**, Full Professor, Dalarna University.

Contacts

For further details and information, please write to: francesco.guarino@unipa.it

Il Direttore del Dipartimento
(Prof. Livan Fratini)

Attachment

- Annex1: Final school Program - IV IEA EBC Annex 83 PhD Summer School.

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Annex 1 - Final Program

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Monday, June 16th

- 08:30–09:00 | Registration
- 09:00–10:00 | Introduction to the school and to Annex 83 – **FRANCESCO GUARINO (UNIVERSITY OF PALERMO)**
- 10:00–11:00 | The Ideal City – **FEDERICO BUTERA (POLYTECHNIC UNIVERSITY MILAN)**
- 11:00–11:30 | Coffee break
- 11:30–13:00 | The role of Positive Energy District (PED) in the transition of urban energy system – **XINGXING ZHANG (DALARNA UNIVERSITY)**
- 13:00–14:00 | Lunch
- 14:00–15:00 | Calculating the Carbon Footprint of universities: the case study of the UNIPA Campus – **SONIA LONGO (UNIVERSITY OF PALERMO)**
- 15:00–15:30 | Coffee break
- 15:30–17:30 | Participants' Presentations and Poster Session

Tuesday, June 17th

- 09:30–11:00 | Holistic approach to designing energy positive, resilient communities: theories, and case studies – **CAROLINE HACHEM-VERMETTE (CONCORDIA UNIVERSITY)**
- 11:00–11:30 | Coffee break
- 11:30–13:00 | Renewable energy decentralization system and the urban space – **PAOLA MARRONE & ILARIA MONTELLA (ROMA TRE UNIVERSITY)**
- 13:00–14:00 | Lunch
- 14:00–15:30 | Theory and practice for Positive Energy Districts: implications from the Agenda 2030 – **ROSARIA VOLPE (UNIVERSITY OF CATANIA)**
- 15:30–16:00 | Coffee break
- 16:00–17:30 | Poster Session
- 18:00–20:00 | Social Event #1

Wednesday, June 18th

- 09:30–11:00 | Another side of the Positive Energy Districts: Industrial-Urban Innovation symbiosis -

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FRANCESCO REDA (VTT TECHNICAL RESEARCH CENTER OF FINLAND)

- 11:00–11:30 | Coffee break
- 11:30–13:00 | Planning for PED – Stakeholders perspectives and involvement – **ADRIANO BISELLO (EURAC RESEARCH)**
- 13:00–14:00 | Lunch
- 14:00–15:30 | Urban Strategy Roadmaps for PEDs: Integrating Co-Creation at Every Step – **CODRUT PAPINA (URBASOFIA)**
- 15:30–16:00 | Coffee break
- 16:00–17:30 | On the relation between the urban heat mitigation and the performance of the built environment: solutions, strategies and impacts – **MICHELE ZINZI (ENEA)**
- 18:00–20:00 | Social Event #2

Thursday, June 19th

- 09:30–11:00 | Modeling costs and emissions for community energy solutions – **URSULA EICKER (CONCORDIA UNIVERSITY)**
- 11:00–11:30 | Coffee break
- 11:30–13:00 | Geospatial database tools for the design and implementation of Positive Clean Energy Districts (PCED) scenarios – **PAOLO CIVIERO (ROMA TRE UNIVERSITY)**
- 13:00–14:00 | Lunch
- 14:00–15:30 | Computing the environmental footprint of PV and BIPV in Positive Energy Districts: the case-study of the NEST project – **MAURIZIO CELLURA (UNIVERSITY OF PALERMO)**
- 15:30–16:00 | Coffee break
- 16:00–17:30 | Poster Final Presentations

Friday, June 20th

- 09:00–10:00 | **Introduction and Welcome**
- 10:00–11:00 | **Panel 1: Positive energy districts and ecological transition: towards a low-carbon future – Moderator: Maurizio Cellura**
- 11:00–11:30 | Coffee break
- 11:30–13:00 | **Panel 2: Research at UNIPA: experiences and projects – Moderator: Francesco Guarino**
- 13:00–14:00 | Lunch
- 14:00–15:30 | **Students presentations**
- 15:30–16:00 | Coffee break
- 16:00–17:00 | **Conclusions**