



Politecnico
di Torino

AA 2022-23 | MSc ARCHITECTURE FOR SUSTAINABILITY | MAST

Energy Transition and Low-Carbon Architecture A

01DXJPX

Introductory seminar

The seminar **aims to investigate some paradigms of the low energy and carbon** built environment, as challenging and contemporary topics of environmental design and assessment.

The goal is therefore **to develop awareness of the most current theories, methods and operational tools**, which can be adopted in subsequent teaching courses.

Architectural Technology

Prof. Francesca Thiébat
Arch. Corrado Carbonaro
Dr Fiamma Morselli

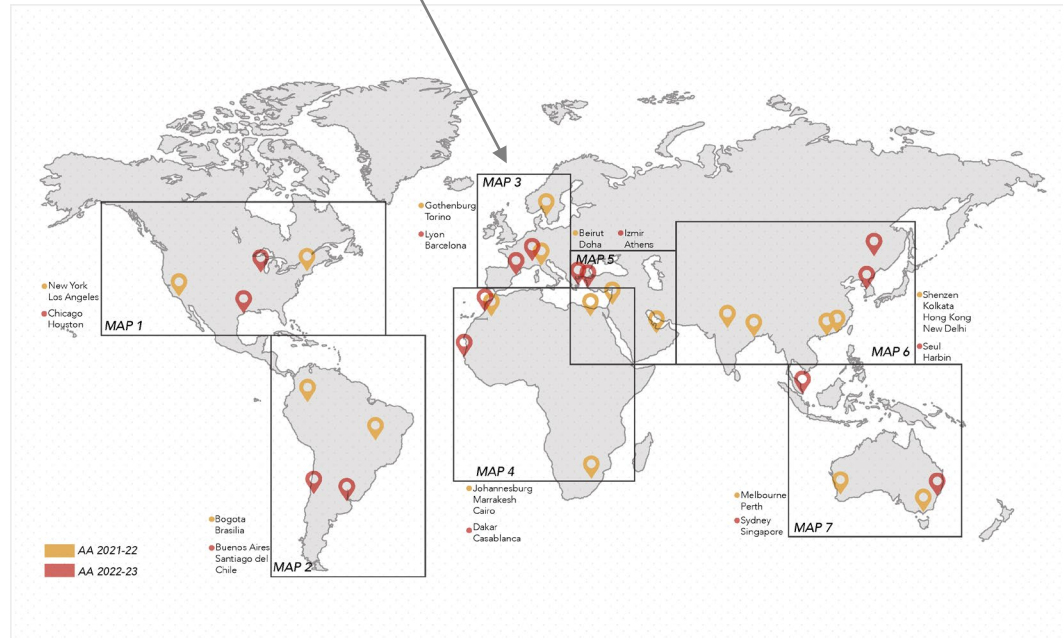
Building Physics

Prof. Marco Simonetti
Ing. Vincenzo Gentile

Torino in a carbon-neutral world



CLIMATE-NEUTRAL & SMART CITIES



Torino has been selected for EU program “100 climate-neutral cities by 2030”.

We will study international examples of cities regeneration and transition.

We will analyse Torino environmental peculiarities and sustainability ambitions as a case study.

Inspired by international examples we will develop solutions and strategies for a climate-neutral Torino

Main focus of Architectural Technology

- **Environmental resources management** at urban and district scale;
- **Active and passive technological systems** for architecture and their integration into the architectural design;
- **Energy and environmental assessment methods** and **tools** for sustainability related to the building life cycle stages.

POLICIES



URBAN STRATEGIES



BUILDINGS & COMPONENTS



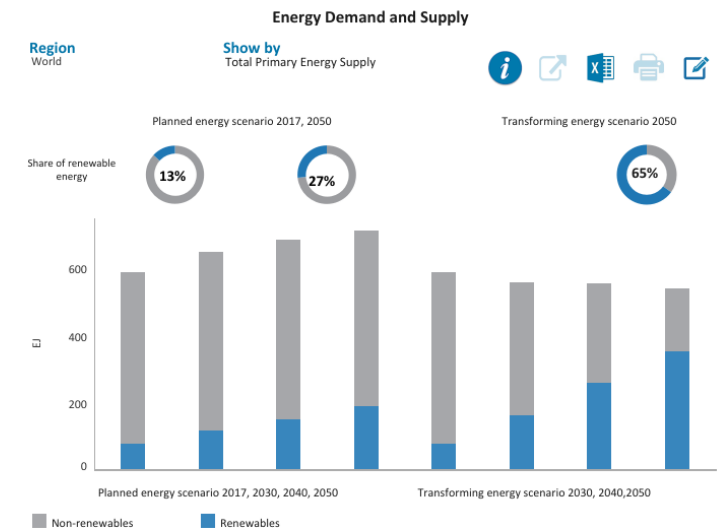
Main focus of Building Physics

- Achieving knowledge about the weight of buildings energy consumption in the global energy systems
- Understanding the link between buildings energy consumptions and the associated environmental externalities
- Getting familiar with the involved scales: is it 1 ton of saved CO₂ emission a lot?
- Learning fundamental calculation tools for energy needs and renewable energies potential
- Integrating building physics point of view in your cultural background

REDUCE THE DEMAND FIRST!



USE RENEWABLE ENERGY





Course topics & time schedule

Humankind is in the middle of a planetary crisis, characterized by climate change, loss of biodiversity, pollution of air, earth and water. The architect must re-elaborate the design process as a potential answer to the crisis, and as a way to improve and to ecologically requalify the city. The seminar transversally and comprehensively **covers the design and evaluation criteria that facilitate the energy transition through a low carbon architecture, considering a wide range of focuses, from urban to building scale.**

Three units will be introduced by a **research question**, which will be investigated by the teachers together with the students and also with the support of invited experts. At the end of each unit, students will be asked to provide a tentative answer. Both lectures and workshops are pre-planned, with the intent of involving a pro-active student participation.

Unit 1 | CHALLENGES

Challenges & best practices

Unit 2 | CITIES

Twin cities: Torino and

Unit 3 | BUILDINGS

District, building, component

WEEK #1

WEEK #5

WEEK #10

Program summary

WEEKS #1-4

UNIT 1
Challenges
& best practices

Goals and policies

From energy sources to final uses

UTOPIAN HOURS
Nuvola Lavazza /online

BEST PRACTICES MAPS (presentation)

UNIT 2
Twin cities: Turin and ...

Sustainable cities

Energy network

Case study / guest lecture

Workshop «City»

WEEKS #5-10

UNIT 3
District Building Component

Design with climate

Building energy performance

Case study / guest lecture

UNIT 2 TWIN CITIES (presentation)

Embodied energy and carbon

Operational energy and carbon

Case study / guest lecture

Workshop «Building»

UNIT 3 BUILDING (presentation)

POSTER PRESENTATION

LECTURES

TALKS/EVENTS

STUDENTS DISCUSSION