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## ST5 – 54 – THE ECO-NEIGHBORHOOD, A COMPLEX SYSTEM. SUSTAINABLE DEVELOPMENT & COMPLEX PROJECT MANAGEMENT

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**Dominante :** CVT (Construction, City, Transportation) and GSI (Large Interacting Systems)

**Langue d'enseignement :** French

**Campus où le cours est proposé :** Paris-Saclay

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### Engineering problem

The eco-neighborhood is an interesting case of a complex system. It requires a multidisciplinary approach combining real estate and construction, mobility (flows and infrastructures), urban networks and the problems of consumption of natural resources (water, energy, waste) but also geography, sociology and the history of places and people. It involves implementation at various scales, from the political decisions required for its emergence and implementation, to the geographical location of the catchment area and the various catchment areas for major facilities, to the choice of heating and lighting methods for each home.

The development market is undergoing a major transformation, with public developers ceding ground to private developers who are emerging among the various real estate developers.

The engineering problematic of this thematic sequence is therefore the following: how to approach all the studies necessary to the creation of an eco-neighborhood in order to make a coherent set of decisions?

The different pedagogical activities will allow students to acquire different technical and managerial skills:

- Knowing how to design or transform the complex systems that are eco-neighborhoods by integrating the many stakeholders with different, even divergent, roles and interests,
- Take into account sustainable development parameters to ensure that the concept of eco-neighborhood is achieved
- Know how to design and plan large complex projects, which can be considered as multiple interdependent projects

### Advised prerequisites

Sufficient level of French to be able to read and understand texts / articles in French



**Context and issue modules:** This part involves major players in the field who will share their vision and their roadmaps. It includes a presentation of the Plateau de Saclay development project by the EPAPS, a visit to a development project that has been or is being carried out in the Ile de France region (and if possible in Paris), and a presentation of international projects by various players.

**Specific course (60 HEE) :** *Sustainable urban planning and development*

**Brief description:** The specific course allows to approach the main disciplines which constitute the urban project, and to prepare the realization during the IE of the main deliverables produced during the design phase.

**Disciplines:** Initiation to the game of actors and the real estate value chain, smart city and sustainable city, urban and peri-urban agriculture, circular economy, energy issues, the Grand Paris Express and mobility, urban planning and eco-district reference.

**Deliverables:** Diagnosis, modeling and exploration of alternatives, economic balance sheet, convergence of multiple coordinated decisions, schematization / representation, scenario of use situations, macro-plan.

**Challenge Week :** Design project for an eco-neighborhood - the case of Corbeville

**Associated partner:** -

- **Location:** Paris-Saclay campus - site visit required

- **Brief description:** How to build the city? The city is made up of different structures: streets and public spaces, urban networks and energy in particular, public and individual transport, buildings and equipment... Complex project management tools are applied here to dissect the interplay of actors that allows the transformation of the city and to address all the disciplines and scales of territories to achieve these major projects.

The situation corresponds to one or several major (imaginary) modifying scenario(s): a 20-year delay of the metro line 18 or replacement of the metro by a tramway or any other scenario... . An urban design competition is launched to take into account this fundamental change.

The pedagogical objectives are the following:



- To handle on a concrete case the main concepts, methods and tools related to a complex project in the field of sustainable development and construction. The generic character and reusability to other contexts will also be important.

- Acquire a first set of knowledge related to the sectoral fields of urban planning, real estate development, smart grids and other urban networks, mobility (intermodality, and infrastructure) in particular.

At the end of the IE, students will have experienced the decision-making systems specific to urban development projects by having analyzed the key stages of specification, design and planning of such projects.