

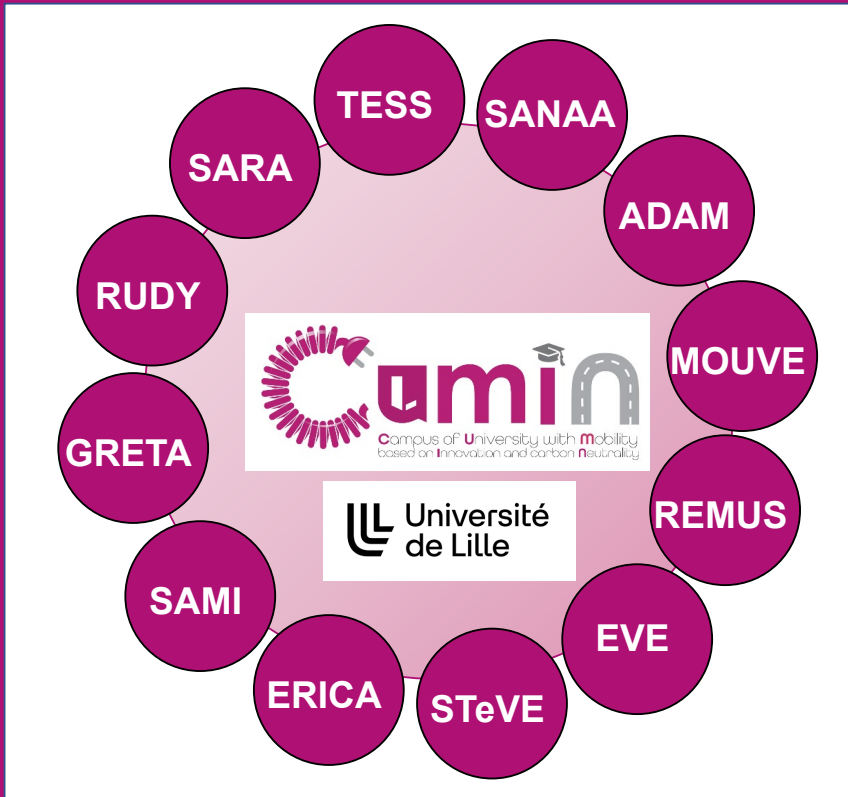


<https://cumin.univ-lille.fr/>

Campus of University with Mobility based on Innovation and Neutral in carbon

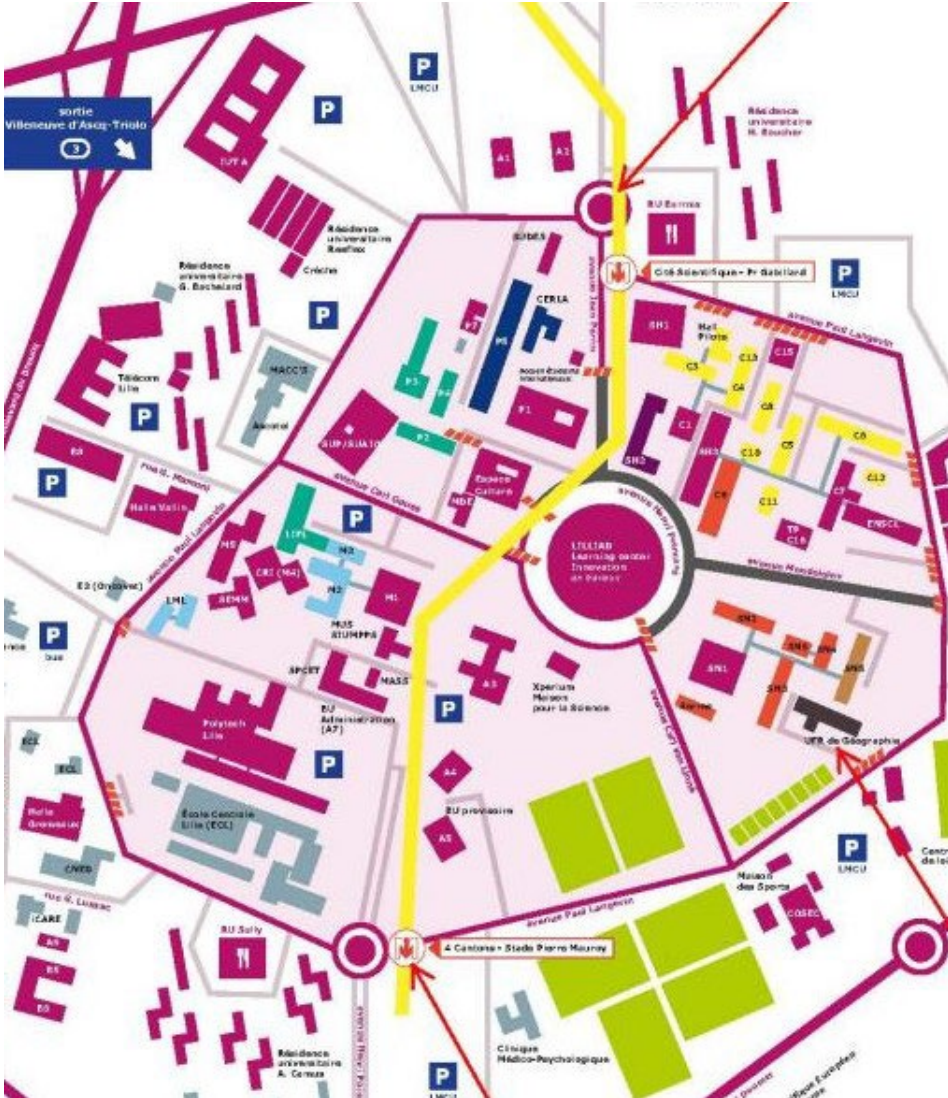
Overview March 2023

Coordination:
Prof. Alain Bouscayrol
(L2EP, Univ. Lille, France)

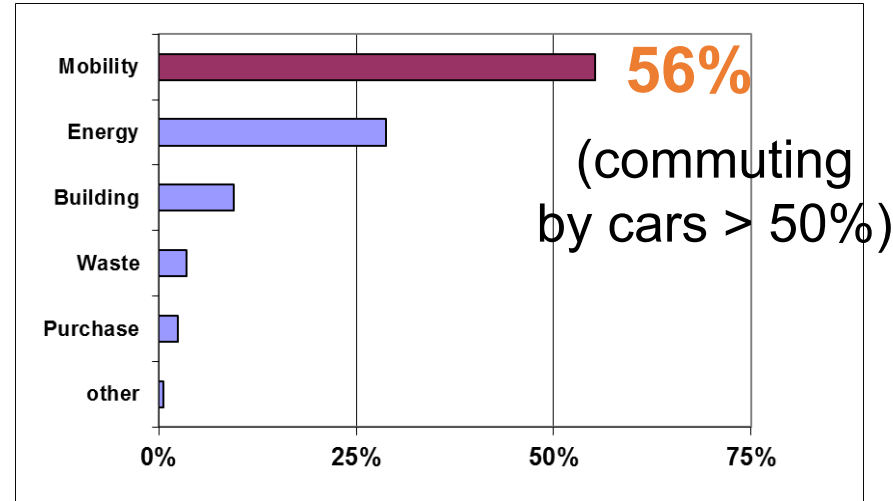


CUMIN Context

Campus "Cité Scientifique" of University of Lille
22 000 users / 80 buildings / 110 ha



Greenhouse Gases



[Bilan Carbone, Lille1, COMUE 2015]

mobility km

- thermal cars 27%
- bus 7%
- subway / trains 63%
- other 3%

mobility GHG

- **thermal cars 78%**
- bus 13%
- subway / trains 4%
- other 4%



2016



CUMIN Objective

First University Campus with mobility neutral in CO₂ equivalent:

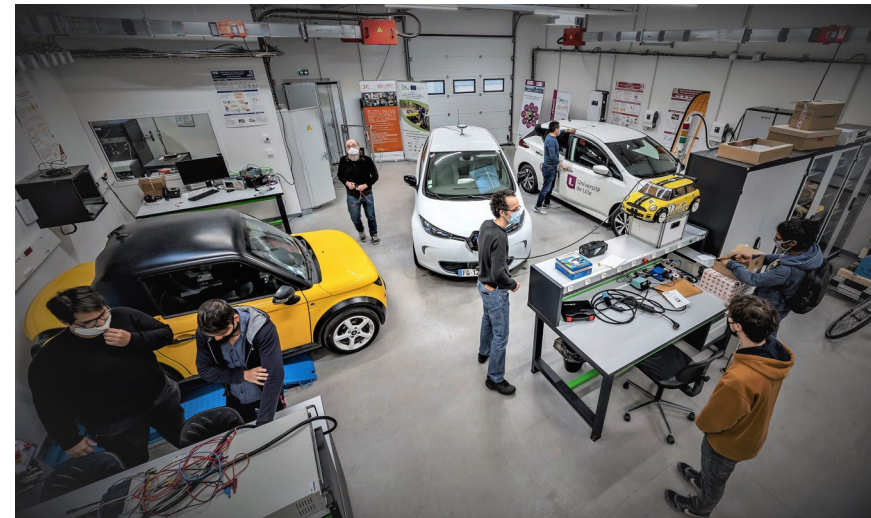
- reduction of the campus GHG thanks to e-mobility
- charging of electric vehicles using Renewable Energy (**sustainable develop.**)
- involvement of the campus users in the development (**living lab**)
- open database from experiences and survey (**open science**)
- flexible methods for extension to any eco-city or area (**society benefit**).

electricity & Vehicle (eV)

- platform (L2EP / TVES)
- e-bikes, segway, e-scooter
- Electric vehicles (Tazzari/Zoe/Leaf)
- Hydrogen vehicle (Toyota Mirai)
- PV-based charging
- Fast Charging station
- Supply subway station
- Driving simulator
- Etc.

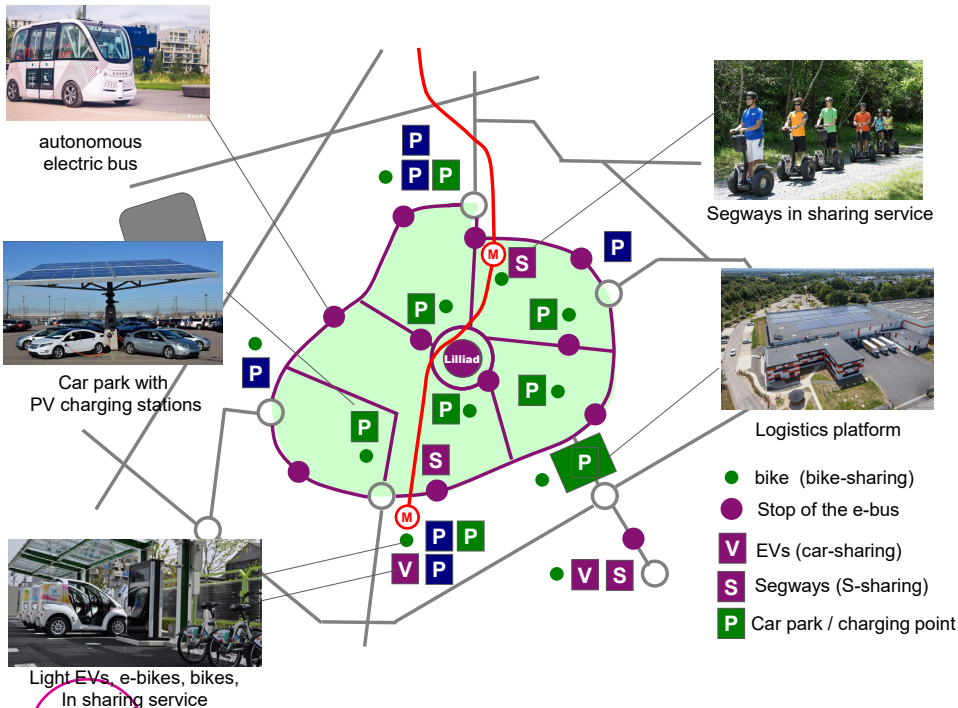
and other platforms

- ATOLL (LOA / solar irradiance)
- TriboFrein (LaMcube, braking particles)



Unique demonstrator campus as a relevant example for new urban mobility

Flexible methods & tools on e-mobility transitions for extensions to eco-cities...



CUMIN portfolio



economical models

autonomous vehicles



users acceptance

SARA

TESS

SANAA



drivers & usage

ADAM



friction emissions

RUDY



charging points

MOUVE



electric subway

REMUS

renewable energy

GRETA



e-bike charging

SAMI



public policy

ERICA

STeVE

EVE

electric vehicles

various vehicles



Funding



Supports



CUMIN

Interdisciplinary team

E-CAMPUS *International associated Lab*

social & human sciences Inst. Research on Hydrogen (Canada)

Université de Lille TVES TERRITOIRES VILLES ENVIRONNEMENT & SOCIÉTÉ EA 4477

L2EP Laboratoire d'électrotechnique et d'électronique de puissance de Lille urbanism & social sciences

electrical engineering Optics & Atmosphere

Example of international collaboration

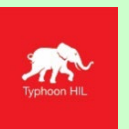


**RIA H2020
(2018-2022)
Coord. ULille**

11 partners
5 countries



Renault Group



SIEMENS



Lille European Metropole
(transport & mobility divisions)



mechanical engineering



Rochester Inst. Tec. (USA)
(economics & public policies)



mechanical engineering
(Belgium)

CUMIN & education

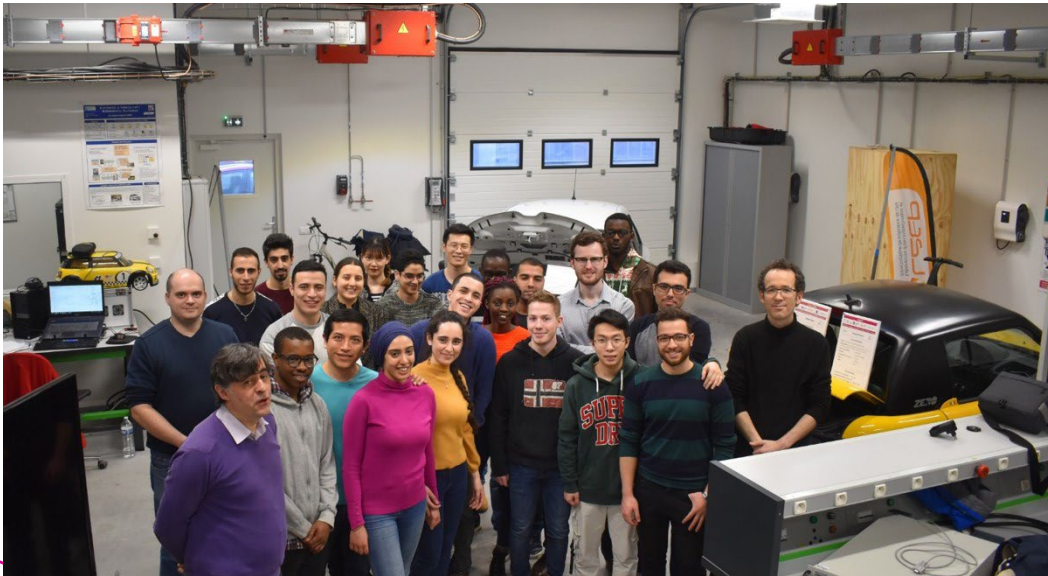


Co-supervised defended PhD

- Anatole Desreveaux, EV consumption, 2020 (CUMIN-EVE)
- **Julia Fottey**, charging station & public policies, 2021 (CUMIN-MOUVE)
- David Ramsey, EV and climate condition, 2021 (eCAMPUS ULille / UQTR Canada)

Co-supervised on-going PhD

- **Eugénie Masclef**, campus mobility usages, (eCAMPUS ULille, UQTR Canada)
- Alla Ndiaye, EV charging strategies (CUMIN-MOUVE, MEGEVH)
- Ayoub Aroua, electrified car, trucks and buses (CUMIN-STeVE, ULille, UGhent, Belgium)
- Ryan O'Berriel, braking energy of subway for EV charging (CUMIN-REMUS, MEL)
- **Salma Fadili**, EV charging structures (CUMIN-MOUVE, ANRT Sherpa Eng.)



CUMIN Master students in 2019-2020

Master theses

10 to 20 per year on sciences & technology, social & human sciences, economics sciences...



ACES'2018 EV driving test

CUMIN Seminars in Master (since 2016)

- M2 Véhicules Electriques Intelligents
- M2 Electrical Eng. for Sustainable Develop
- M2 Projet urbain et ville durable

CUMIN

“Green Mobility” unit (Doctoral schools since 2019)

- 7 seminars of 2h
- Lectures in English
- Speakers from CUMIN (ULille+USA+Canada)
- various aspects of e-mobility: technical, societal, economical,...)
- 12 PhD students in average

Summer Schools

- Annual **EMR** summer schools (Lille even year, abroad odd year)
- **ACES** summer school every 2 years



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CUMIN programme

Our campus as
an exciting living lab
towards eco-cities!

