



Resource Efficiency in Higher Education UPC-BarcelonaTech

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ETSAV – VALLÈS SCHOOL OF ARCHITECTURE

UNIVERSITAT POLITÈCNICA DE CATALUNYA (UPC) – BARCELONA TECH





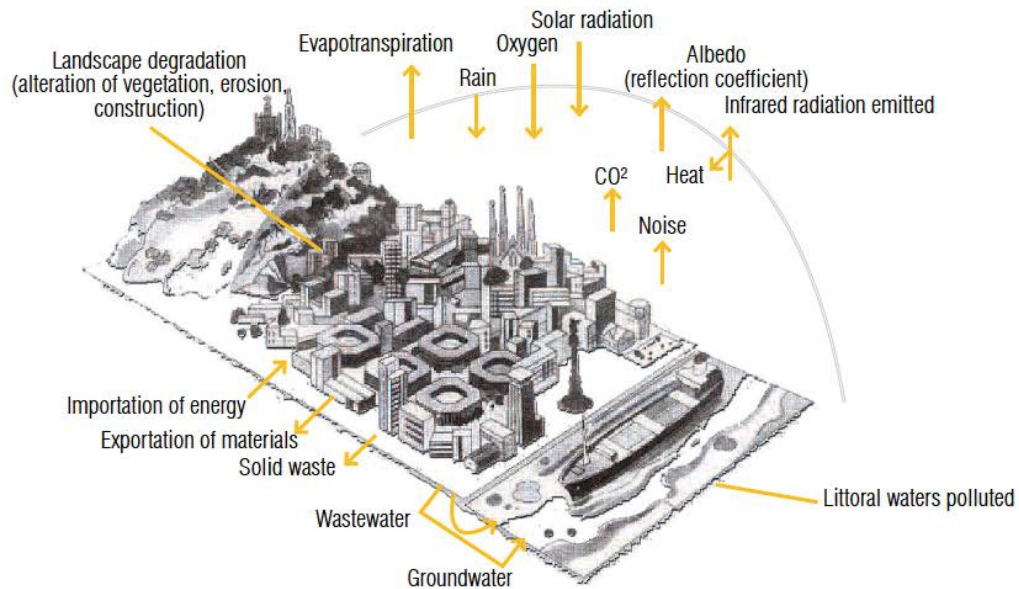
CHALLENGES



A large, vibrant crowd of people is gathered on a riverbank and in the water, celebrating a festival. Many people are using colorful inflatable rafts and floats, including unicorns, swans, and other fun shapes. The scene is lively and festive, with people splashing and enjoying the water. The text 'EFFICIENCY SUFFICIENCY CIRCULARITY' is overlaid in large white letters.

EFFICIENCY SUFFICIENCY CIRCULARITY

Environmental sustainability: urban metabolism



Urban Metabolism of Barcelona.

Source Image and (2): Master in Sustainability (2012-13). UPC BarcelonaTech. Subject: Urban and territorial development. Francesc Magrinyà

ARCHITECTURE / URBANISM



SUSTAINABLE LIFESTYLES



SPANISH UNIVERSITY SYSTEM

SPANISH UNIVERSITIES / UPC

GENERAL NUMBERS

- 76 universities: 52 public / 24 private
- Over 1.5 million students

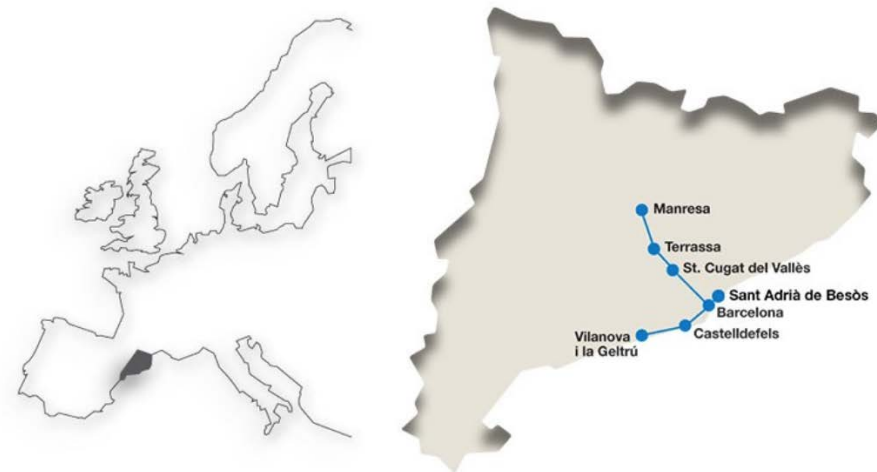
SPANISH UNIVERSITY SYSTEM

- Green and Sustainable Science and Technology – low performance reported
- Divide between policies and results
- Strength: university community's engagement

UNIVERSITAT POLITÈCNICA DE CATALUNYA (UPC)

- 28,000 Students
- 3,300 Teaching and Research Staff
- 9 campuses distributed over territory

Campus UPC. Broader presence





INSTITUTIONAL APPROACH UPC



UPC BARCELONA TECH



INSTITUTION

Institutional politics, organization and infrastructure

- Promoting the collective transition towards higher sustainability
- Declaration of Barcelona (EESD) / Declaration of Catalan Universities – SDG's 2030
- Campus Lab Initiative - Energy Efficiency Measures, Environmental Office, RE's

TEACHING / RESEARCH

Interdisciplinary Institute for Sustainability Science and Technology (ISST)

- MSc / PhD Programs on Sustainability – Joint Master with Architecture /Urbanism
- ERASMUS+: Circular Design - Learning for Innovative Design for Sustainability (L4IDS)

OUTREACH TO SOCIETY

Supporting societies transformation

- Education of next generation professionals – 'game changers' – InnoEnergy (EIT)
- Participation in societal value discussions – architecture / cities / energy / environment
- Specific lighthouse projects - transition towards sustainable architecture and lifestyles



BOTTOM UP APPROACH ETSAV (UPC)

LIVING LAB ECOSYSTEM – SOLAR DECATHLON EUROPE

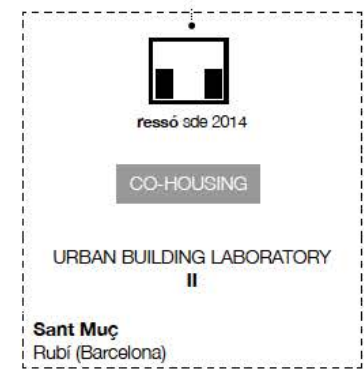
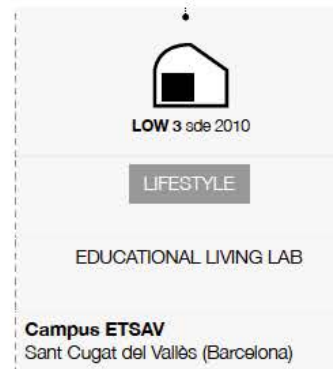
PROTOTYPES OF ENERGY SELF-SUFFICIENT, SUSTAINABLE HOUSING PLANNED, CONSTRUCTED AND OPERATED BY STUDENTS

Solar Decathlon Prototypes create ecosystem between academia and society

Holistic approach to sustainable housing and lifestyle through participatory processes

3 different approaches to collective housing:

- LOW3 sde 2010: cohousing prototype
- (e)co sde 2012: community platform
- Ressò sde 2014: urban infrastructure



Ecosystem of Solar Decathlon Europe prototypes of UPC Barcelona Tech (competitions 2010 / 2012 / 2014)

Source: courtesy of arqbag cooperativa d'arquitectura (2016)

SUSTAINABLE HOUSING



COLLECTIVE HOUSING CONCEPTS

LOW3 SDE 2010 UPC



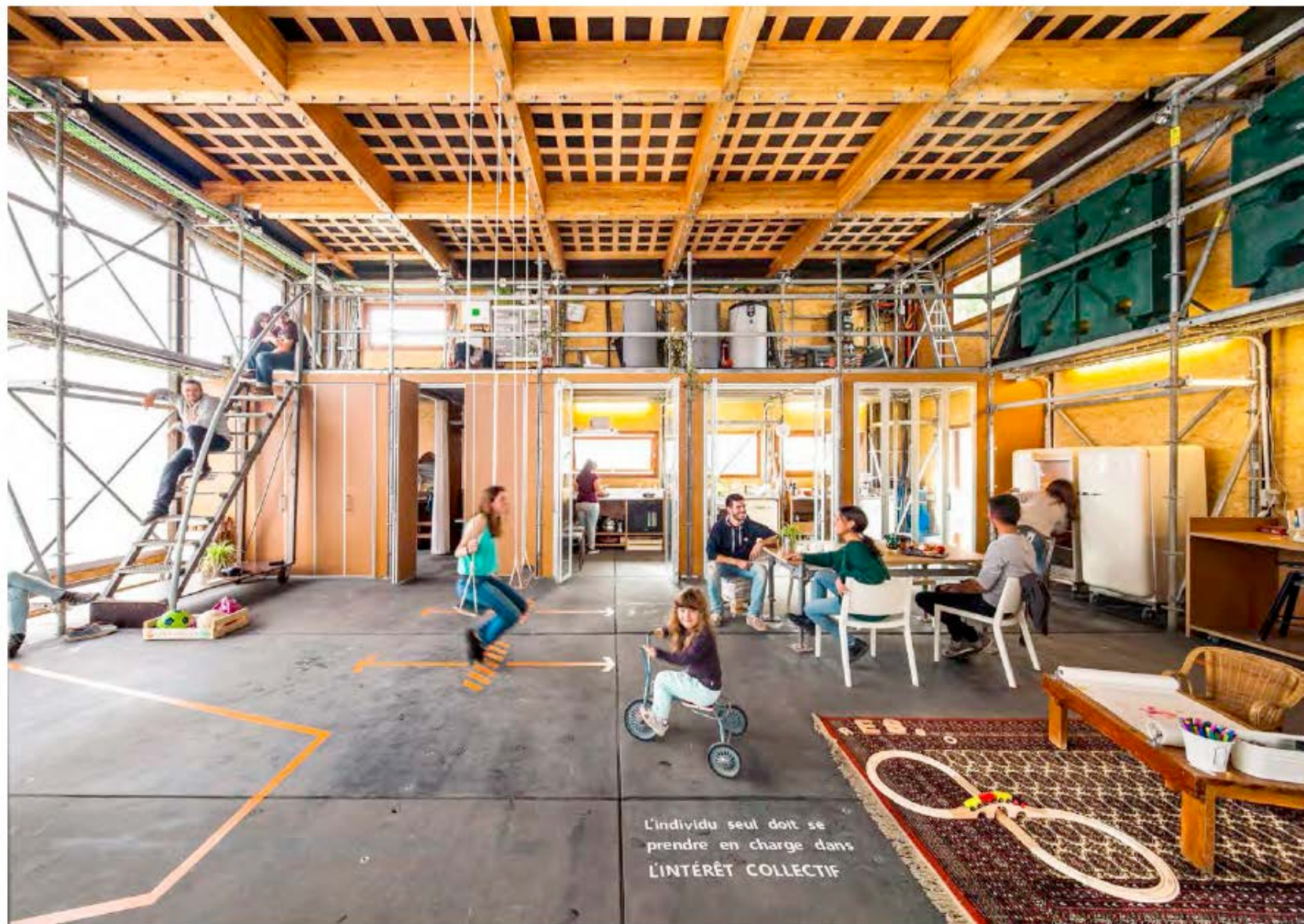
(e)co SDE 2012 UPC







RESSÒ SDE 2014 UPC















arqbag
coop

construcció

participació

energia

+ info



Comissió d'habitatge
Sant Cugat del Vallès



Tallers arquiescola
Barcelona



Cohabitatge Sènior
Guimerà



Re-creant
CEM Centre d'estudis Mollet



Masia Pujol
Altès de Bassella, Alt Urgell



Coop d'habitatges Coop de Falç
Sarrià, Barcelona





Cooperativa d'habitatges en cessió d'ús "La Regadora"

Autors: arqbag + poma arquitectura

Client: Cooperativa Cohabitem Sant Andreu

Equip: BBG estructures, Arrevolt SCCL, M7 engineers, Coque Claret, Dani Calatayud, Anna Cases, Ivar Palumbo

Lloc: les Casernes de Sant Andreu, Barcelona

Data: 2020

Superfície: 3528m² (x35 habitatges en cessió d'ús)





CONCLUSIONS



RESOURCE EFFICIENCY IN HIGHER EDUCATION OUTLOOK

- Training future professionals for a **world of uncertainties** through experience-based education
- **Challenge-driven education** attending societal challenges together with public and private stakeholders
- **University as important social actor** for life-long learning, value discussion, prototype initiatives and the link between research, application and societal outreach
- **Generational change** of teaching staff / curricula needs time
- Mix of **top-down and bottom-up approaches** with the ultimate goal: creating new generations of “game changers”