



MSCA-PF hosting offer: Post doctoral position in off-site wood structure sustainable construction

In the frame the EU program *Marie Skłodowska Curie Postdoctoral Fellowship* (MSCA-PF)¹

A- Company and location

The mission will be managed in collaboration by 2 entities in which the candidate will be received: the start-up **KOJI**² and the Technological Research Centre for sustainable construction **NOBATEK/INEF4**³.

Location:

Metropole of **Bordeaux** (France), where KOJI has his offices and fabrication site, and NOBATEK/INEF4 his second offices.

The candidate will have also the possibility to work from time to time in Anglet (FR; ocean cost in Bask Country) where are headquarters of NOBATEK/INEF4.



Companies:

The candidate will be mainly (75-80%) integrated to the company KOJI.

KOJI is a start-up specialized in Off-site wood structure construction, integrating high energetic performances and circular concepts. The company is part of the innovative young companies' incubator Bordeaux Technowest and integrated his prefabrication site in Bassens (Bdx Metropole) in a collaborative industrial site specialised in sustainable construction. Other young companies are for example CIRCOULEUR (recycled paints), a company of Straw insulation, Coop&Bat (engineering and activities).

The candidate will work mainly with 2 of the associates: Benjamin LACLAU, Building Engineer specialised in R&D and Circular Economy (he participated to many national and European R&D projects on circular concepts applied to construction); Béranger ARNAREZ, in charge of industry in Naval construction (Bénéteau);

NOBATEK/INEF4 will receive the candidate (20-25%) of his time. **NOBATEK/INEF4** is the main Technological Centre in sustainable construction and planning in France. It leads R&D and market services, at local to international level (it coordinates many European projects on Sustainable construction technologies). Main issues are energetic efficiency, Circular Economy, LCA.

It is an attractive job environment, in both companies with young teams passionate by sustainability, in a good compromise between scientific and applied development, in a beautiful and dynamic city, close to the Ocean cost, having the possibility to participate to interesting other R&D projects in parallel to the main one.

KOJI and NOBATEK/INEF4 are in development and there are many employment opportunities both for low and high degree profiles. As start-up, KOJI offers also the possibility to be part of the first employees and interesting careers.

¹ <https://marie-skłodowska-curie-actions.ec.europa.eu/actions/postdoctoral-fellowships>

² <https://koji-factory.fr/> (Under construction – Coming soon)

³ <https://www.nobatek.inef4.com/en/>



B- Mission(s) and position

3 alternatives are proposed that are part of the start-up KOJI technological road map and are interesting R&D teams of NOBATEK/INEF4. We can detail a project with the candidate on one of them. A mix can also be done. Finally, KOJI will also study new propositions of the candidate.

- **Summer comfort in wood offsite construction**

Technologic and scientific study of T° variations and calories absorptions for thermal inertia in specific wood structure walls, roofs and at 3D module level.

Study of the performances of a new low carbon nocturnal exchanger system integrated in envelop with earth elements (modelling of thermal exchanges, ventilation flows...). Optimization of the system. Opportunity of patenting the system will be studied.

More globally, work in parallel on the whole bioclimatic conception of the modules optimizing summer comfort.

The candidate will work on building performance modelling (product, wall level (Wufi for ex) and building level (DesignBuilder, Pleiades...), bio climatic building design and prototyping for real demonstrators.

- **Mechanical connection and implementation system between 3D building modules**

One of the main strategic points of modular construction is the implementation on site and the mechanical connexion between 3D modules. The technological surveillance shows that there are not conventional solutions and companies proposes their own technics, most of the time not ideal.

The objective is to develop a mechanical system that allow a precise connection between modules and that serve as physical guide when modules are implemented by crane. The system can be composed by diverse pieces in function of their place on the wood structure, and installed in prefabrication.

Works will consist on product design, mechanical modelling (static and dynamic), prototyping, and test on scale 1 modules. Methodology of the logistic for raising and bring modules closer will have to be studied.

Opportunity of patenting the technical system will be studied.

- **Water and Energetic autonomy of Building**

KOJI aims to develop and propose autonomous offsite buildings to can offer sustainable solutions to away territories, social temporary housing. This at building level but also at mini district level.

KOJI started discussions with other start-ups like Tergys⁴ for this purpose.

The aim of the project will be to study the solutions of water and energetic autonomy already existing at building/district levels, make a critical review, propose solution adapted to KOJI context. Design and study works will include performances modelling, economical aspects, initiation of collaborations, prototyping.

⁴ <https://tergys.com/en/>



C- Profile of the candidate

The successful candidate (PhD) should have a strong background in (and/or):

- Wood construction, preferably with experience in offsite (Modular) construction
- Modelling of hygrothermal phenomenon and energetic performances in building environment
- Product design and mechanical modelling
- Energetic and water autonomy in construction

He must control design and modelling programs used in product design and overall used in Building sector. He has also to be fluent in English, and control of French or Spanish will be positive point.

Finally, the candidate must be **creative and highly motivated** to join our promising start-up that aims to push the lines of the construction toward sustainability, circular economy, and resilience.

To abide by the **MSCA eligibility rules, the candidate can't have spent more than 12 months in France in the past 3 years. His/her research experience after the PhD graduation can't exceed 8 years.**

D- Other conditions

Salary: see salary proposed by the Marie Curie program, that is higher than the medium salary observed in France for Post doc. In function of results, additional bonus could be proposed. If Patent is an output of the project, the developer will be part of the inventors.

Extra project professional activities: A part of the main R&D project, the candidate could participate (financed) to technologic and scientific conferences, will be integrated to working and influence groups, and could participate to EU projects in which KOJI and NOBATEK/INEF4 are/will participate.

Nonprofessional activities: The region is very interesting for life activities (ocean, mountain, forest, great city and cultures). Employees of KOJI and NBK will do their best to facilitate the social integration of the candidate and advice him/her to the great activities in the region.

Teleworking: accepted under conditions

E- Application process

It's a 2-step process. First, the company will identify the eligible candidate. Then, the successful candidate will apply together with the company for a MSCA-PF funding. The project is ideally built collaboratively.

Application: CV + cover letter

To be sent before 13th of August at b.laclau@koi-factory.fr (please set service.europe@xylofutur.fr in copy)