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URBAN INNOVATIVE ACTIONS

The Urban Lab of Europe !

The CoRDEES Project Journal N°2

*Project led by the **City of Paris***

ENERGY TRANSITION

European Union
European Regional Development Fund

Région Hauts-de-France

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1. Executive summary

The project is running at full capacity. Since the previous edition of the Journal, many activities have taken place in Clichy-Batignolles and the true dimension of the project has been revealed.

If one activity has to be highlighted for the last six months, this should be communication. The number of people and companies working in the district is enormous; the interests and capacities are very diverse; the limitations are wide and the benefits of communicating to achieve a common objective have been demonstrated in these months, in which the construction works of the different buildings have also progressed significantly.

Of all the objectives identified at the beginning of the project, some have been achieved, but most of them are being negotiated each day in the district. There are meetings, workshops, brainstorming sessions and all kinds of networking events where a few or many stakeholders sit around a table to reach consensual decisions, using the tools and protocols to which they have to stick, each in their position. All decisions agreed make the team navigate in the same direction.

In this second journal, we have tried to extract the lessons learned in relation to all those consensus decisions, in which so many different stakeholders seem to agree to achieve the common objectives of the CoRDEES Project; to become an example and guide for other districts and cities. We wanted also to introduce the protagonists of the CoRDEES consortium, because they are the ones who make the “engine” work at full capacity.

The following journal will be published in autumn, and promises to be full of news related to the decisions made this spring among all those involved in the success of the CORDEES Project.

2. The CorDEES protagonists

The five Partners of the CoRDEES Project have made significant progress in the past months. Lots of meetings have taken place and many agreements have been reached. In this second Journal, we go a bit beyond the company´s description and profile, and introduce the responsible persons in charge of the activities for CoRDEES.

Fabienne Giboudeaux - City of Paris - Smart city department

City planner (Université Marne la Vallée – Paris), graduated with a masters´ degree in urbanism. Fabienne Giboudeaux is in charge of coordinating, monitoring and communicating the CoRDEES Project progress. She ensures the connection of Partners with the different City Departments involved.

Denis Muller - Smart Grids & Smart City Project Manager at EMBIX

Denis gets a complementary joint course. Graduated from Centrale Paris, he has been able to develop skills in Sweden within the Royal Institute of Technology (KTH) getting a specialisation in sustainable energy management and in renewable energies. Today, Denis is involved in consulting hub projects and contributes to the EMBIX energetic management solution development, Urban Power™.

Téo García - Project Manager at PBA

Engineer ENGEES graduated in 2017. Winner of the 2017 "Territorial Engineer" competition of the Territorial Public Service "Infrastructures and Networks". Project Manager at Paris Batignolles Aménagement, on the CoRDEES project, and more specifically on the implementation of the Smart-Grids into each plot. He supervises the technical missions in the framework of the development of the Energy Facilitator devices.

Nicolas Rougé - Une Autre Ville

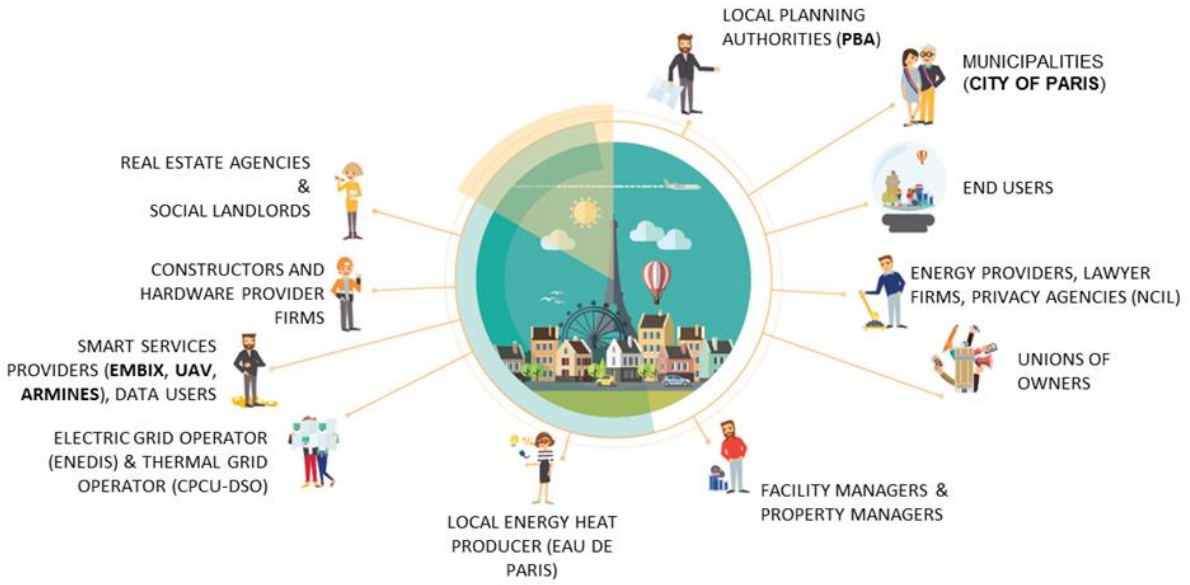
Engineer (Centrale Paris) and urbanist (Sciences Po Paris - Urban Planning Cycle and March in Urban Design, Bartlett School of Architecture, London). Founder of the consulting firm Une Autre Ville. In the context of the CoRDEES project, Nicolas is responsible of the services work package and also participates in the definition of the energy facilitator and the evolution in the contractual links between the stakeholders.

Thomas Bertou - Energy efficiency engineer, Ph.D. - MINES ParisTech - ARMINES

Thomas Berthou is a researcher at Mines ParisTech. He has a PhD in energy efficiency and is an expert in large scale buildings simulation and optimisation. He aims to develop a hybrid and replicable methods for District Energy Performance Assessment in the works under deployment in the CoRDEES Project.

3. The technical challenges

As a continuation of the information presented in the first Journal, the technical challenges are being addressed not only with the concerned Project Partners, but also in cooperation with a myriad of stakeholders which collaboration, directly or indirectly, is needed for these challenges to be overcome, sometimes in a measurable way, and others in the form of an unlock decision.



The CORDEES stakeholders list (Source: PBA)

3.1. The Community Energy Management Platform (CEMP)

This challenge deals with the development of the commitment scenarios for the CEMP and its related services, the development of contractual schemes, the business models of the Urban Energy New Deal and USTF and the general coordination of digital and field services.

For the development of the CEMP, a key task is to overcome the existing legal and privacy barriers when monitoring energy parameters provided by different suppliers (heat, electricity, water…), and at different levels (hourly, daily, etc.). Moreover, dwellings also have different tenure structures (owned or rented, privately or social housing rates), and building energy services are managed by different energy managers.

One of the key challenges for the successful development of the CEMP is related to data management, both in terms of legal framework and collaboration with key stakeholders. Not only in Paris, but in many other cities, the root problem when dealing with energy consumption data is twofold. On the one hand, the privacy of citizens' consumption habits must be respected. On the other hand, their consumption profiles are valuable loyalty and recruitment tools for supply companies, which can adapt their rates and conditions (as long as the market allows it) to them, to improve their service and maximize

their efficiency in the energy vector supply, be it electricity, heat or water.

Since the launch of the project, project partners have notably faced some reluctance of the different stakeholders (mainly the electric and thermal grid operators, CPCU and ENEDIS) to share their data with CoRDEES. This reluctance was related to the intrinsic value which consumption data has for them.

In order to overcome this reluctance, the project hired a lawyers firm to support project partners to unlock these resistances by providing a common understanding ground for all: legal limitations imposed by the regulation, privacy and users´ rights, and data value for energy suppliers are three boundaries among which a common place has to be found, sacrificing a part of the original situation for the common good of the three parties involved.

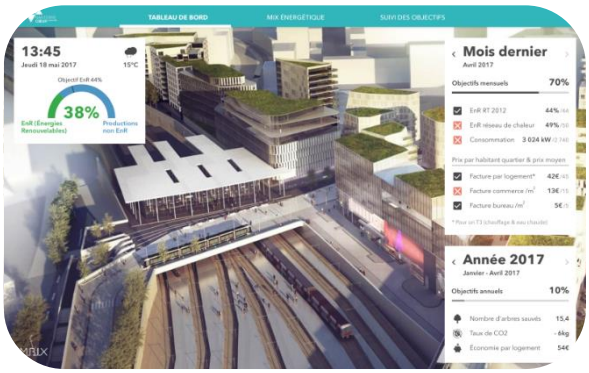
Good progress can now be noted with the first data collection conventions signed or being negotiated with some key players and data providers (e.g; Eau de Paris for water, ENEDIS for electricity, CPCU for the heating network etc.)

Another obstacle during this reporting period has been the change in the national regulatory framework related to personal data collection. The Municipality of Paris organized several meetings as well as some more formal steps to consult the French Commission Nationale de l'informatique et des libertés (CNIL, a public national agency in charge of data and information privacy management) to collect their recommendations about data collection, storage and management. Their answer is expected soon and may have an important impact on the project for the limitations it might impose to data sharing among stakeholders. This has required extra effort from the project partners and generated some additional delays in the CEMP development.

In relation to the CEMP, a **data repository** has been created for all Parties involved to have access to the data base which is being generated. The initial data uploaded corresponds to the Eau de Paris (geothermal producer). The shared nature of the data base is part of the agreements reached in the negotiation of data access and sharing by the different parties involved.

Data repository interface for the CoRDEES monitoring period (Source: EMBIX)

Also, the design of the **CEMP User Interface** has started during this period. Some examples of previously realized User Interfaces are shown below to give an idea of how this may look like in the future:



General overview of District performance (Source: EMBIX)

In relation to **data collection from buildings**, CoRDEES Partner Paris Batignolles Aménagement (PBA) has also achieved progress thanks to the collaboration with two different stakeholders. On one hand, the selection of the ITC technology provider was done by EMBIX, CoRDEES partner, with expertise in the technology and with a clear idea of which data has to be metered. On the other hand, the

authorization of the real estate agencies for the building owners to install such ITC devices was provided by Partner PBA, which has knowledge of legal constraints, and a "commercial" profile to engage the building operator as beneficiary of such installation. These two steps, and the two stakeholders, are generally needed when trying to compile data from buildings.

At a **district energy level**, there are three last open issues under development these days: The electric vehicles charging stations, the electric energy storage systems, and the PV self-consumption strategy definition. The first two topics have a limited amount of budget for physical equipment, but the strategies designed to manage them will be an example for other communities.

3.2. The Urban Energy New Deal (UNED)

The Project Team is working on the definition of specific activities to be led by the USTF, the design of the new contracting scheme of the Urban Energy New Deal via negotiation with different stakeholders involved in the district development, particularly working in the design and implementation of B2C services.

After 10 months of procedures and meetings with IT companies, the **framework contract for the instrumentation** of the West-side buildings of Clichy-Batignolles has been launched. Two companies have been selected for the building sensors installation, which has already started.

In parallel to this, three other **service providers** have been designated by PBA to support the project in the development and the implementation of three different areas: First of all, an energy specialist lawyer has temporarily joined the team to provide assistance in the development of the services (to pave the way for future works without legal mistakes). Second, an engineering firm has been hired to provide field services for the proper integration of the defined monitoring devices (ensuring a successful monitoring phase by on-site presence where fast-reactions are typically needed). Finally, for the operation and control strategies to be implemented in the boilers´ room, another specialized firm is supporting the partnership to ensure proper project execution on-site.

There are two common challenges related to the elaboration of these three contracts. On one hand, you need to know how much responsibility to give to each contractor, and how to clearly define it, without interfering one to the other and with the common goal of an efficient building energy behaviour. On the other hand, you need to know how long the relation with them must be, and how this relation will be managed, in terms of contract flexibility, renovations, cancellation policies and other topics needed for long-term synergic relations among the three stakeholders, and PBA.

The last remarkable progress is that the **instrumentation program** has been defined for the first building, the ALLURE tower, with 118 dwellings, first building to be delivered to the real estate agency. Heat, electricity and water meters will be installed for an estimated amount of 200,000€.

In the definition of the relation of the monitoring program with the tenants, once they live in their new houses, the strategies for involvement are under preparation, and three main ideas are on the table. Tenants will have all the information in the common areas of the buildings, and on the Project Website, and they will have the opportunity to leave the initiative if they wish to. This provides transparency and

liberty, still both to be evaluated once implemented.

ALLURE Building 3D model (Source: SCI Paris O6B Fresh Architecture)

3.3. The Urban Energy Services (UES)

This challenge focuses on the development of methods and numerical models for project monitoring and evaluation. These models have to pursue tenant/user commitment towards low energy responsible behaviour at dwelling, workspace and building level.

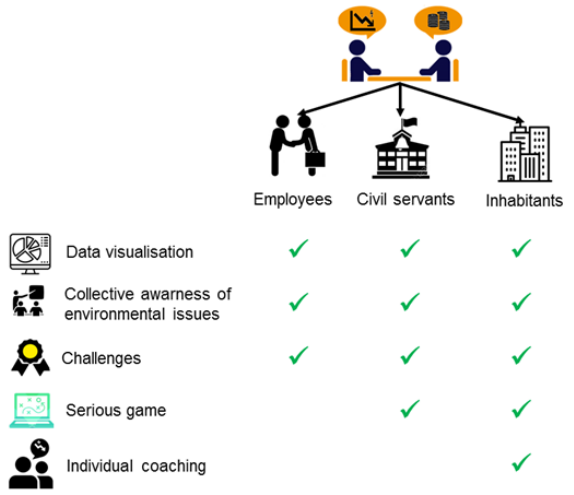
In the past months, activities related to the Urban Energy Services have switched from exploratory to operational. The most relevant amount of work has been focused **on the definition of the B2B services**: services for building owners, energy managers and property managers.

A company has been selected via public tender, to provide several services during 18 months. All of them aim at engaging the stakeholders to move in the same direction, aiming as well at achieving a successful installation of the technologies (production and monitoring). Some of these works can be seen in the following figure:

Services to be included in the B2B contracts

(Source: Une Autre Ville)

Another topic where Une Autre Ville has dedicated efforts with significant progress is the definition of the scenarios for the **energy coaching services to be provided in a B2C strategy**, where different services will be launched via public tender in the next months.



Services to be included in the B2C contracts

(Source: Une Autre Ville)

Another tool implemented to enhance the commitment of the users is the **«Hub des initiatives»**. The « hub » will be a website or a dashboard on the CoRDEES platform, which will allows citizens of the CoRDEES area to submit projects and ideas related to energy and environmental issues and vote for the ones they want to see deployed. This will engage citizens, and will raise awareness through their collaborative participation in initiatives which aim at improving the district performance in terms of efficiency and environmental quality.

3.4. Monitoring and evaluation

In this case, the challenge includes the design, development and implementation of the CEMP, the User interface and the overall energy services platform, with the collaboration (and to be approved by) both end-users and energy operators.

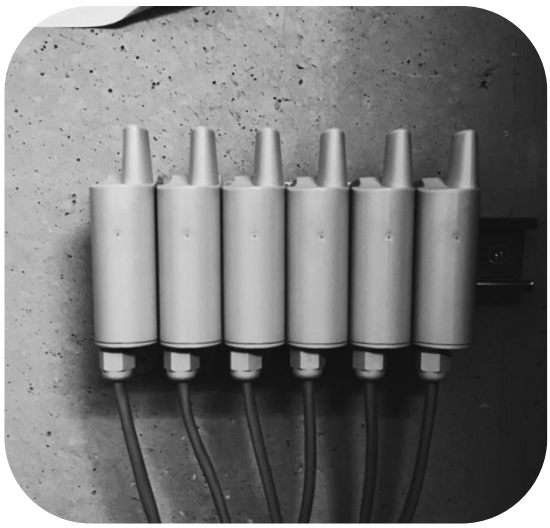
The monitoring activities are still in an early stage of deployment, as the first sensors are being installed these days. To prepare the scenarios to be followed when data starts to be gathered, a report has been elaborated to compare Clichy-Batignolles with other European green districts. The most relevant outcome in this regard is that, apparently, there is no specific method to evaluate district performances based on real monitoring data coming from such a large number of sensors installed in such a large number of housing units. A challenge is therefore set for the coming months, and its dimension is truly ambitious.

There are several important factors to consider in this respect. Two of them may be highlighted here: First, the building typology mix conditions the energy intensity of the whole district; as an example, an efficient shop may need more energy per square meter than an efficient home, and each district has a different proportion of homes and shops (residential, academic, education, commercial mixes are virtually endless...), so this is a factor to be probably aggregated somehow at district level. Second, the indicators chosen to measure energy performance are also a key issue to consider; typically, CO2 emissions, primary or final energy use have different conversion factors depending on the type of primary resources and the national energy mix in each country, so this is also an important issue to work on.

All in all, if we add the possibility of having local energy production (the so-called prosumers) and the possible presence of some off-the-grid facilities (electric vehicles or isolated PV arrays) within the districts themselves, the problem becomes even more complex.

It seems that there is a need for a methodology or a standard which defines efficiency and performance at district or city level, which considers all these possible configurations. A possible tool to connect all these ideas may be based on the new technologies, which may provide new models which connect B2B and B2C

together with “Peer to Peer” decentralized cooperative participation towards a solution.



Heating and hot water consumption encrypted radio transmitter installed at the ALLURE Building (Source: PBA)

4. Implementation-related challenges

The implementation-related challenges are those cross-cutting challenges (for more information, please read Journal n°1 here) under continuous revision throughout the CoRDEES Project execution. The challenges considered in this section need to be continuously faced on the way to the accomplishment of the technical challenges. Up to now, after one year of project implementation, there are several lessons learned which relevance may be of interest, and can be read in the following sections.

The West side of the district in February 2018 (Author: Juan de las Cuevas)

4.1. Leadership for implementation

Individual interests need to be balanced towards the consecution of a global and common objective.

In order to get the buildings monitored and to awake the interest of tenants towards responsible and smart energy behaviours, it is necessary to take into consideration the sequence of the events that occur when a building is constructed. In the different phases from the design, the construction and the delivery of the houses, there are diverse actors participating, and from the beginning, there

must be an independent entity to ensure compliance with this common objective, which does not belong to any of those actors in particular, but to all of them in general, and by that, it is by the participation of all of them that the objective may become a reality. Somehow all the stakeholders should be linked by the common goal of the Project.

These links are the components of the chain of success, mainly technical and legal, and go inextricably linked with the evolution of the project in time: for each phase of the construction process, there is a series of actors and a series of technical and legal limitations, which must be foreseen and organized so that the result is aligned with the global interest to achieve a green district project.

Given the complexity of the problem and the large number of actors involved in each phase, specialized advice from independent companies should be available, so that conflicts of interests are minimized, and recommendations are as objective and practical as possible. In the CoRDEES project, during the past months, different services have been hired from law firms, engineering studios, ICT companies and environmental services companies so that all these links are properly aligned from the design phase to the delivery the homes of its users, and beyond, in their daily life at the district.

4.2. Eco-Public procurement

It may become a barrier towards innovation penetration at user level.

Regarding the services contracting by public entities, competitions should be understood as a challenge and an opportunity at the same time. It is necessary to establish rounds of prior consultations, analyse similar situations that have occurred in other similar projects. One important thing happening in Clichy-Batignolles is that are sitting around the same table all those involved in the actions to be taken and the consequences thereof, assigning responsible parties and specifying responsibilities. Both quantitatively and qualitatively.

As a small list of examples, to avoid privacy problems, you can aggregate individual consumption data; in order to involve the users of the dwellings, the aggregate consumption rates can be published on bulletin boards in the common areas of the buildings; to make inhabitants active participants, you can publicly reward their responsible energy behaviour.

It is important also to highlight the fact that, to get the best out of the data obtained, these data must be collected and stored from the very beginning of the activities. Of course, data bases have to be built with an agreed structure as many stakeholders will make use of them, and all data must be accessible to all stakeholders involved, since everything that is measured can be improved, and the more people have access to the data, the more of ideas may arise to improve its analysis.

An attic with views in the ALLURE building

(Author: Juan de las Cuevas)

4.3. Cross-department working

Not only internally, but also among different companies, one can see different cultures, rules and working methods which typically lead to low level of clear communication.

Again, meetings, workshops, teleconferences and any type of action in which all stakeholders involved are physically present should be organized, from the beginning, being transparent and leaving evidence of all progress made.

Each involved party must clearly explain their interests and position towards any relevant topic on the table. Their capabilities, their responsibilities and the boundary conditions they are willing to consider should also be shared with the rest of stakeholders. The different departments must be aware of the fact that, over and individual interests, the common objective of a large project will be beneficial for all. Without early and permanent communication it is not possible to avoid the conflicts of interest, both technical, economic and legal, and above all, conflicts at the level of companies or departments, with different managers, different objectives, budgets and reporting manners.

The CORDEES Partners are organizing meetings and workshops with a purely informative nature, followed by others where important decisions are made. In both type of meetings, it is important to count with experts in the various subjects that are dealt with, which are in charge of setting limits to the agreements from the beginning. These limits always leave space for consensus, and it is in the common project's benefit that those areas of consensus should be defined.

4.4. Participative approach

Continuous engagement of all stakeholders must be coordinated by Delivery Partners in order to keep the team united and walking in the same direction since the very beginning.

The life cycle of the construction project is just a small part of the life cycle of the district. At the same time, the CoRDEES life span covers part of both construction and operational phases of the district, and its impact should be visible during the whole District´s life time. This is indeed a real challenge, since the activities deployed in three years should deeply stay in the district inhabitants and operators for many years.

All actors should feel involved and everyone should be able to visualize the effect of their decisions and the benefit for their own companies in the common project, with this historic perspective. Without everyone seeing something positive in each decision, it is difficult to move forward with satisfaction for all. From the moment when a partner is not satisfied, is losing money or moves out of their “interest zone”, the team is unbalanced and tensions will arise.

This involvement is being achieved at CoRDEES thanks to transparency and fluid communications. For example, it is necessary to dedicate time to reach consensus on important decisions, for this reason periodic meetings are organized between interested parties on a specific matter, in order to progress and maintain the interest of all. Certainly, contracts have to be drawn up to formalize the commitments agreed, and these must be seen as a tool to achieve the agreed upon, rather than as a limitation to stick to particular interests.

The focus is therefore to be put mainly on three specific actors which interests may be organized somehow in cascade, and with whom negotiations will have to be well prepared, individually and in group meetings: the building owners, as a key interface between the energy operators and tenants; the energy operators themselves, as another key interface between the building owners and the third actor; the network energy managers (be it heat, electricity or some other). Once these three groups of stakeholders agree on a common framework for collaborations, the rest will start to be easier.

4.5. Quantification of the results

And the added value of the deployed measures.

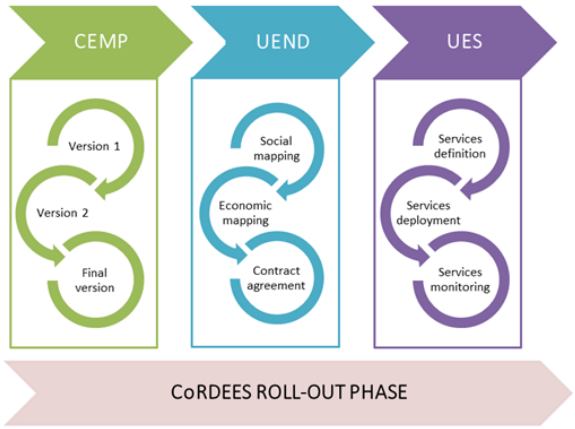
We are at an early stage of the project in which we can think that the results are not yet visible, and certainly, the technical results related to the efficiency of the district in operation are not yet visible. Even so, it is necessary to understand that the results are also achieved on the way to final success, and each agreement, each consented decision, each positive step in the negotiations during the design, construction, monitoring, delivery of the housing and the behaviour of the tenants once the district is inhabited, are small successes that add up when it comes to the end. In this sense, success is not the goal, but the path travelled.

At this point, it is good to have references from other green districts, which is why studies have been done in which to have a reference of how far others who have followed a similar objective have arrived. From these studies, it is clear that the challenge is enormous, since there does not seem to be many examples of the size of CORDEES in the monitoring and provision of B2B and B2C services in France and in the rest of Europe.

5. What to see next autumn in Clichy-Batignolles

The rest of the spring and the next coming summer promise to come full of breakthroughs and good news in Paris. The work progresses actively on all fronts, at different speeds, but with good rhythm. The first tenants will be installed in their homes in the coming weeks and we will finally have "real life" to monitor, evaluate, and real tenants to involve and to deploy the strategies developed so far.

If the project team keeps the pace of work progress, and the communications remain active, constant and fluent with all stakeholders working around the Clichy-Batignolles blocks under construction, we will certainly see good news and another pile of lessons learned in the fall.



Flow diagram with Project tasks´ evolution (Author: Juan de las Cuevas)

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UIA projects will produce a wealth of knowledge stemming from the implementation of the innovative solutions for sustainable urban development that are of interest for city practitioners and stakeholders across the EU. This journal is a paper written by a UIA Expert that captures and disseminates the lessons learnt from the project implementation and the good practices identified. The journals will be structured around the main challenges of implementation identified and faced at local level by UIA projects. They will be published on a regular basis on the UIA website.