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The Urban Lab of Europe !

The Vilawatt project Journal N° 4

Project led by the City of Viladecans



**ENERGY
TRANSITION**



The Vilawatt project

The VILAWATT project seeks to secure a stable energy transition process through deep energy renovation of residential buildings in one of the most deprived districts of Viladecans, helping the city tackle fuel poverty. The project will create an innovative Public-Private-Citizen governance Partnership (PPCP), structured around 3 main pillars. First, a Local Energy Operator will be established to act as a local energy supplier and renewable energy producer. An Energy Savings Company, offering renovation and energy saving services to its members (the municipality, businesses and citizens) will be created. Finally, a financial mechanism to capitalise the energy savings (generated through contracts with households having benefited from initial investments) will be used by the new entity to further invest in deep energy renovations in the municipality. A new energy currency linked to the savings will work as an incentive for energy efficiency and as a mechanism to increase the economic capacity of vulnerable groups. The project will involve regional stakeholders active in the fields of ethical banking, community management, social innovation, renewable energy and energy efficiency.

Partnership

- Ajuntament de Viladecans
- Agència d'ecologia urbana de Barcelona - Public agency
- UBIQUAT TECHNOLOGIES S.L. - Private company
- ICAEN - Institut Català de l'Energia - Research center
- Associació LIMA - Low Impact Mediterranean Architecture - Private Company
- CERCLE GESPROMAT S.L. - Private Company
- EGM - Private Company
- VIGEM - Viladecans Grup d'Empreses Municipals, S.L. - Municipally-owned company
- VIDEM - Viladecans Grup d'Empreses Municipals, S.L. - Municipally-owned company
- CICLICA SCCL - Cooperative

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1. Executive Summary

As outlined in the previous Journals, Vilawatt is an innovative urban development project that conjugates four major innovative aspects: a thorough stakeholder engagement and communication strategy (also aimed at increasing energy culture), a participated governance structure (the Public Private Citizens Partnership or PPCP and Local Energy Operator or LEO), an energy efficient building retrofit programme and a virtual currency.

In year 2018 Vilawatt has established itself as a Spanish examples in social innovation in community energy in Europe at a time in which this theme is becoming part of a nexus (i.e. an overarching discourse) that includes energy poverty and energy access.

The project has almost fully overcome the administrative and legal bottlenecks that held it

back from progressing its core components and will need to fully invest the remaining time on implementation and achievement to reach all milestones before project end date.

Lessons learnt reveal that cooperation between Project Management Office and municipality determines the resilience of a project, that running and stress-testing “the business case for the end users” should be a key part of the planning phase and that, in non-fiat money circulations, incentive mechanisms to adoption/retention should be preferred to currency conversion barriers.

Going forward, the Ajuntament will have to focus even more on full delivery and to that end, might want to consider increasing its resources.

2. Context Evolution



Year 2019 opens with community energy, energy poverty and energy efficiency as trending topics in the Energy Transition/Sustainable Development/Social Change nexus.

Since the launch of its Clean Energy for All Europeans¹ package, the European Commission looks at “energy efficiency [...] as complementary to social security policies when tackling energy poverty at Member States level”. In this framework, a share of energy efficiency measures under the EE obligation schemes or under an Energy Efficiency National Fund, should “be implemented as a priority among vulnerable groups, including those affected by energy poverty and, where appropriate, in social housing”.

In January 2019, a new assessment of draft national energy and climate plans by the Coalition for Energy Savings² showed that Member States’ contributions are inadequate to

secure the achievement of the EU 2030 energy efficiency target (28.7% EE by 2030 against the 32.5% targeted).

According to the International Energy Agency (IEA)³ buildings and construction sectors combined are responsible for 36% of global final energy consumption and nearly 40% of total CO₂ emissions, figures set to rise as access to energy, greater ownership of appliances and growth in global buildings floor area increase.

In this framework, it is clear that targets can’t be reached only via a top-down (i.e. a policy- or investment-driven approach) approach and that bottom-up involvement of local is indeed a key complement. In February 2019, members of the Community Energy Coalition published a booklet to explain how EU’s new renewable energy legislation boost local energy transition initiatives, allowing communities and individuals

¹ Clean Energy for All Europeans, available on: <https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/clean-energy-all-europeans>

² 2030 national energy efficiency contributions short of EU target, available on: <http://energycoalition.eu/29012019-2030-national-energy-efficiency-contributions-short-eu-target>

³ IEA Buildings section, available on: <https://www.iea.org/tcep/buildings/>

to generate, store, consume and sell their own energy. According to studies, half of EU citizens – including local communities, schools and hospitals – could be producing their own renewable electricity by 2050, meeting 45% of their energy demand⁴.

Community energy initiatives also continue to be pioneered in Member States. In Ireland, the SEAI Community Energy Grant Scheme Applications are now open and up to €25 million of Government funds are available towards projects that deliver energy savings to communities, including public buildings, homes and businesses. From the first round to the present date, community grants worth €125 million have underpinned over €300 million investment in upgrades to 17,500 homes and 2000 non domestic buildings, producing annual energy savings estimated in excess of €50 million⁵.

Beyond the European Dimension, in early 2019, the Canadian government announced that it will allocate further CAD 2.2 billion to support

community energy systems and the planning of clean energy projects, lowering energy costs for Canadian households “by partnering with the Federation of Canadian Municipalities to increase energy efficiency in residential, commercial and multi-use buildings”⁶.

As for Spain, the recently founded Chair of Energy and Poverty of the Comillas University estimates that a minimum of 8-9% of the Spanish population (that corresponds to more than 6 million people) suffers energy poverty⁷. As social innovations are gaining in importance in respect to the future sustainability of society as a whole, Spanish governance system (where substantial power is devolved to regions and municipalities) is set to become fertile soil for community energy initiatives addressing this very aspect. What’s more, Vilawatt is now quoted as one of the two main Spanish examples of social innovation in community energy in Europe (Hewitt et al, 2018⁸), signalling it is fulfilling its UIA’s mission to become an inspiration for practitioners and decision-makers.

⁴ Unleashing the power of community renewable energy, available on: <http://www.energy-cities.eu/UNLEASHING-THE-POWER-OF-COMMUNITY-RENEWABLE-ENERGY>

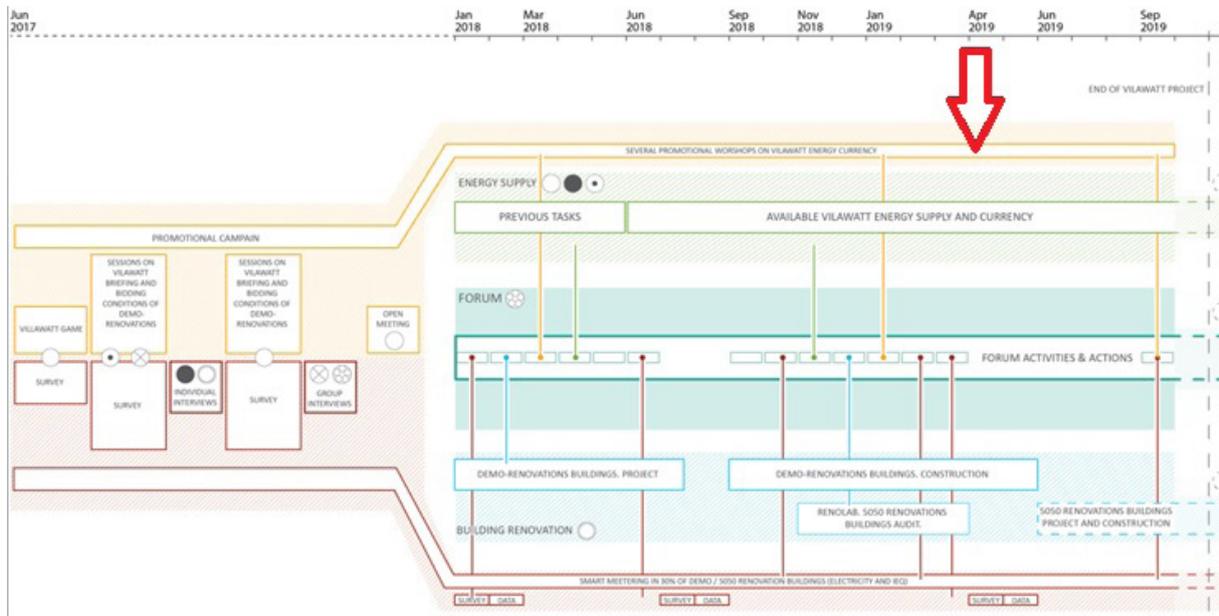
⁵ SEAI Community Energy Grant Scheme 2019, available on: <https://www.seai.ie/news-and-media/community-energy-grant-sc/>

⁶ Canada’s new budget plan eyes efficiency, EVs and community energy, available on: <https://www.pv-magazine.com/2019/03/22/canadas-new-budget-plan-eyes-efficiency-evs-and-community-energy/>

⁷ Chair of Energy and Poverty, available on: <https://www.comillas.edu/en/chair-of-energy-and-poverty>

⁸ Social innovation in community energy in Europe: a review of the evidence, available on: https://www.researchgate.net/publication/328510582_Social_innovation_in_community_energy_in_Europe_a_review_of_the_eviden

3. Implementation Status



The project timeline

Entering its second year, the project should now be 75% complete. A brief analysis of the status suggests that the project is benefitting from its early investment on engagement, with more owners of commercial and residential properties signing up to participate to the demo-renovations, around 30 professionals attending the training courses and a set of participative spaces fully functional and open to the public. However, its core elements (renovations, local energy company, virtual currency) are just about starting to materialize.

The demo renovation works to be done in the selected communities is to start by June. The procurement procedure has been completed and the construction company selected. In the meantime, however, renovation contracts with the communities had to be re-negotiated to overcome some early-adopters' reluctance to participate due to the increased tax value of the post-refurbished dwellings.

The Ajuntament will soon launch the aggregated purchase of the energy supply for the district. This will fill the gap until the PPCP (and with it the Local Energy Operator, LEO) is fully operational. The purchase will be led by the project partner GESPROMAT. An open day with face-to-face meetings for energy distribution companies has been organised, explaining Vilawatt needs and requirements. In the meantime, a green energy open procurement call has been initiated for the interested energy distributors/producers. Traction has been good, with 12 energy distribution company expressing interest in three initiative.

The PPCP and the One Stop Administration (i.e. the two main organs of participated planning) are about to become fully functional.

The legal statutes of the PPCP has been finalized and have been approved by the plenary session of the *Ajuntament de Viladecans* within April. This is the last step in the administrative

process to create such a Consortium. The same approval process has been undertaken by the *Àrea Metropolitana de Barcelona*. As for the private and citizenship participation, this will be ensured by the joining of the *Club d'Empresaris de Viladecans* and of a new *Citizens' Association* composed by members of the public that have been involved in the 'Espais Vilawatt' from the very beginning. Other actors initially foreseen, such as the Demo renovated communities and the *Associació de Comerciants de Viladecans*, will join the PPCP at a later stage, subject to –respectively- signature of the renovation contracts with the Ajuntament and finalisation of the Local Energy Operator.

In the meantime, the One Stop Administration (OSA) has now moved into a dedicated Vilawatt Office located besides the central food market of Viladecans and employs a staff of 5 people. Its activities of public engagement and marketing of Vilawatt (coordinate by PP CERCLE GESPROMAT), coordination with the Consortium steering board and finalisation of the evaluation and reporting system are now well underway. Furthermore, the OSA has so far managed to collect almost 575 energy bills and 275 bill datasets from individual citizens, whose energy demand (i.e. shape, rates, fixed costs, level of market understanding) have informed the initial contacts between Local Energy Operator and energy distributors.



The One-Stop-Administration

One aspect that still lags behind is the launch and implementation of the virtual currency. As for the PPCP, this is again due to legal issues unforeseen at planning stage. In particular, the currency retention period and fees (established in order to enforce the use of Vilawatt within the local economy) seems to represent a barrier to consider the Vilawatt as electronic money. The Spanish Law (21/2011) implementing the Directive 2000/46/EC states that *“a bearer of electronic money may (...) ask the issuer to redeem it at par value (...) free of charges other than those strictly necessary to carry out that operation”*. So, no delays and no additional fees can be arbitrarily applied in order to disincentive the currency redemption.

This has required a more finely-grained definition of the legal relationship between platform users

and the Electronic Money Institution (EMI) which is now being finalised. As a contingency plan, the currency introduction is being developed in two phases, starting with a more flexible system (i.e. one without early conversion fees and utilizing a simple payment app).

Additionally, the legal report contracted by the City Council points out that, even in a 'Phase 2', a future Vilawatt token won't be allowed to be exchanged in a secondary token market because that would be against its nature of electronic money. This however won't be a problem because the Vilawatt currency will not be tokenized in a legal and financial sense. In Phase 2, the Vilawatt currency will still maintain its nature of electronic money while adding to it a “token-like” technical

interface that will allow the Ajuntament to handle it in a blockchain-friendly way.

Summarizing, no ERC20, no token exchange, no independent monetary mass but only a token-like interface that will allow a smart contract-based interoperability. Each transaction, including cash-in/out, will be implemented in complete coordination with the EMI. So Vilawatt will become the first *tokenabled* electronic money, that is, currency combining the legal safeguards of electronic money and the technical improvements of tokens (with some restrictions).

The implementing EMI has been hired in April 2019, via an open call launched in January.

Creating a currency community, that is an urban network of commercial activities and individuals willing to accept/adopt a complementary currency, is no easy task. For this reason, the Consortium has decided to support the currency project partner (UBIQUAT) by hiring a full-time agent, or currency **broker**, in order to engage merchants and local citizens to become part of the Vilawatt currency.

An extra effort is also being put in ensuring a currency scale-up, as UBIQUAT and the Consortium are developing a blockchain-based payment app and connecting it to the EMI. The new payment app will be integrated with the existing “TastaViladecans”, a tourism-booster city app maintained by the City Council and currently used to showcase Viladecans current merchants’ offering. With this integration, “TastaViladecans 2.0” will enable a complete shopping experience while allowing payments with local currency, so helping to expand it to the entire municipality.

Summarising, Vilawatt has encountered some unforeseen bottlenecks during its early implementation phase. Having succeeded to resolve most of them, the Ajuntament is now proceeding with the parallel implementation of both governance mechanisms and energy efficiency infrastructure, supported by a series of alternative solutions devised to progress with the project whilst obstacles were being resolved. Currently, Vilawatt milestones still look fully implementable by program end; achievements in the next 6 months will dictate whether the project can reach a 100% success score.

4. Lessons Learnt

In this more mature phase of the project, Viladecans is facing the challenge of juggling between several project aspects simultaneously and, crucially, despite the delays. Whilst the project engagement management functions are now mature and proving effective, and a strong sense of energy responsibility has been built within the community, core infrastructural implementation is still in an initial phase.

The first lesson learnt is, therefore, that investing early on, with a clear and comprehensive planning structure, in engagement reduces resistance to change and transforms the project in an opportunity of empowerment for the community. Vilawatt has definitely succeeded at this. In this perspective, the Ajuntament's decision of hiring a currency broker to promote use of the virtual money, and its strategy of integrating the Vilawatt currency within the existing municipal app, is lungimirant.

Previous journals repeatedly highlighted the importance of resolving the practical administrative and legal feasibility of the project structures early on or, even better, already at planning stage. The lesson proved to be valid again in this phase, where legal issues slowed down implementation of the virtual currency. By the same token, innovation projects requiring customer engagement and complex administrative undertakings should consider longer implementation periods.

Similarly, tax issues (or any financial aspect with a direct impact on end users) can impact the level of public commitment/engagement, particularly in urban contexts characterized by low disposable incomes. Financial impacts on

end users can also cascade onto other project aspects and structures: in Vilawatt, homeowners and commerce associations decided not to sign up to the Consortium and the Local Energy Operator until bottlenecks hadn't been properly addressed. As a countermeasure, practitioners are advised to include, within the planning, a simulation of the business case at the level of the individual user. This might, in turn, lead to consider adding a profit buffer (at the level of either the final user or the municipality) as a safety margin for "unforeseen expenses".

Finally, by looking at the implementation status of each project component, some further specific learning points emerge.

Firstly, the importance of cooperation between Project Management Office and municipality. In Viladecans, the Ajuntament has been instrumental in creating "plan Bs" when governance or legal structures struggled to materialize: The municipality has formed the One-Stop-Administration (OSA) as an operational branch of the PPCP and is preparing to negotiate the energy supply contracts until the Local Energy Operator is established.

Secondly, the importance of one-stop-shops (in this case the OSA) in managing information flows from/to the public and in coordinating engagement initiatives with the project implementation timeline. In Viladecans, the OSA has been efficient in aggregating energy demand to prepare negotiations with distributors; this dataset will also prove useful to evaluate the project performance and to showcase before-after case studies so as to promote citizenship engagement (and mass adoption).

The most important project-specific lesson, in this phase, relates to the virtual currency. Retention periods (i.e. rules established a minimum time before a virtual currency can be exchanged back) may add an additional layer of complexity to the already challenging endeavor of non-fiat money circulation. At planning phase, practitioners might want to investigate alternative methods to avoid instant reconversions into money

format. For example, having a periodic clearance mechanism at the level of the Electronic Money Authority, or at municipal level, can offer end users the reassurance that energy savings will eventually be fully monetized. Another solution could be offering small incentives for currency retainers/users, such as bonus points counting towards prizes or tax credits/tax discounts.

5. Challenges and Focus Aspects

During this reporting period, Vilawatt continued – as expected - to face coordination challenges. Again, as with the virtual currency introduction, the Project Management Office and the MUA managed to implement alternative temporary solutions to circumnavigate legal and administrative bottlenecks, whilst also tackling them and planning for a seamless scale-up.

Given the delays and the limited residual time, the project needs to invest in implementation speed, adding extra resources especially where it is easier to do so, that is at the level of those structures (such as the Consortium and the Project Management Office) that are directly under control of the Ajuntament and/or free from procurement constraints.

Another upcoming challenge will be to ensure a seamless transition from a municipality-based control to the PPCP and the Local Energy Operator once these governance structure will be finalized. Not only the process might require contractual adjustments (for example between the energy distributor and the Local Energy Operator), but it will likely happen at a time when all main decisions relative to the project (e.g. energy supply, renovations and currency) will have been already taken. Therefore, the PCCP as a “participated governance structure” might end up only managing the operational phase of the project rather than (as initially planned) playing an active decisional role in it, which might impact the level of consensus/engagement. The Ajuntament should ensure any future scale-up is truly participated in all its aspects and, to this end, it might want to look at reserving, now, the possibility to renegotiate project-related long term contracts in the short term.

Contractual flexibility, especially on the energy supply side, will also protect Vilawatt from markets volatility and from any judgement error around the assumptions underlying the business model. It might also allow to integrate innovative aspects such as metering/monitoring technology innovation or demand response arrangements.

As for the virtual currency, the major challenge will be to introduce and expand it at a time when not only energy savings haven't materialized yet, but the very building renovation that should trigger it has not even started and energy supply has not been renegotiated. The very dynamics that should fuel Vilawatt are about one year away and its functioning hasn't yet been 'explained' to the public; as a consequence, not only end users do not understand the currency, but are even unable to start experimenting with it. Whilst the Ajuntament has been clever in introducing a currency broker, it should soon start its communication, training and engagement efforts for this project component (we understand this is being currently actioned), and pair them with some form of initial currency adoption incentive or mechanism (like payment of subsidies with local currency).

Finally, implementation delays also means it might be impossible to obtain data on performance metrics before the project ends. This would require either a change in the project evaluation methodology, for example by transforming it into a forecast of impacts (based on project data) with sensitivity analysis, or in the performance indicators themselves (this latter option being at the same time consistent and more onerous).

6. Conclusion

This journal has presented a recollection of Vilawatt progress and lessons learnt since November 2018, as well as upcoming challenges and focus aspects. Vilawatt has now passed 75% of its project timeline. In the past months, most of the bottlenecks blocking implementation of its main components have been resolved whilst temporary alternative arrangements have allowed to maintain development and coordination on track on all dimensions. It is therefore expected that the next reporting period will see most milestones being finally reached, with an appropriate set of resources and enabling mechanisms.

Whilst renovations, introduction of participated governance and municipal energy supply are within reach, success of the virtual currency and ability to run a sound performance assessment before project ends remain a concern. Both these aspects will be therefore a focus of the next Journal, with the Vilawatt currency being also the subject of the upcoming Zoom.

The Ajuntament is already trying to anticipate residual issues with the same good level of flexibility and coordination demonstrated in the past, but it might need to step up its efforts in forecasting outcomes (i.e. scenario analysis on business models and financial mechanisms) in order to be successful.

Urban Innovative Actions (UIA) is an Initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Based on article 8 of ERDF, the Initiative has a total ERDF budget of EUR 372 million for 2014-2020.

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.



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