



# Final Report

*(Abbreviated version)*

## Data Project

<b>Project start date:</b>	<01/10/2015>
<b>Project end date:</b>	<31/03/2018> <b>Extension date:</b> <31/12/2018 >
<b>Total budget:</b>	605,496.00€
<b>EU contribution:</b>	340,613.00€
<b>Contract number</b>	LIFE14 ENV/ES/000703

## Data Beneficiary

<b>Name Beneficiary:</b>	Asociación de Investigación de Materiales Plásticos y Conexas (AIMPLAS)
<b>Contact email</b>	sostenibilidad@aimplas.es
<b>Project Website:</b>	<a href="http://www.life-future-project.eu/">http://www.life-future-project.eu/</a>



## 1. Table of contents

1. Table of contents .....	2
2. List of keywords and abbreviations .....	3
3. Executive Summary .....	4
4. Introduction .....	6
4.1. Background, problems and objectives .....	6
4.2. Expected longer term results .....	7
5. Technical part .....	9
5.1. Technical progress .....	9
5.2. Evaluation of Project Implementation .....	22
5.3. Analysis of benefits .....	24
6. Key Project-level Indicators .....	28



## 2. List of keywords and abbreviations

ACRONYM	DESCRIPTION
GPP	Green public procurement
LCA	Life cycle assessment
SoftVT	Technological Watch Service of AIMPLAS
GHG	Greenhouse gases
GUF Tool	Green Urban Furniture Tool
TOPSIS	Technique for Order Preference by Similarity to Ideal Solution
EC	European Commission
CML	A problem-oriented Life Cycle Assessment (LCA) method developed by the Institute of Environmental Sciences of the University of Leiden
ReCiPe	Method for the impact assessment in a LCA
EU	European Union
REACH	European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
DALY	Disability-Adjusted Life Years



### 3. Executive Summary

The LIFE FUTURE – “Sustainable Urban FURniTURE: Tool design to perform environmental assessments in the green procurement framework” was a 39-month project that started on 01/10/2015 and ended on 31/12/2018, according to the 9 extra months extension amended on 2017.

The LIFE FUTURE project developed and validated an online tool to promote green public procurement (GPP) of urban furniture. Specifically, this Green Urban Furniture Tool, hereafter the GUF Tool, guides users throughout the whole tender process for public procurement of urban furniture in which environmental impacts are willing to be considered. On one side, for the person in charge of generating a GPP for urban furniture considering environmental impacts, the GUF Tool helps to easily select the criteria to be included in the tender, to provide mechanism for validating such criteria in the products being offered and to evaluate the best environmentally assessed product. On the other side, for the manufacturers and suppliers of urban furniture products, the GUF Tool provides a single site for searching active tenders, a user-friendly platform to fulfil these criteria, with detailed information and explanation about these criteria, and to environmentally score their products against others offered to the same tender by other companies.

Main result of the LIFE FUTURE project is the fully operative GUF Tool, available online<sup>1</sup> at <http://lifefuture.uji.es/>. Indeed, this on-line tool also provides a detailed manual and complementary video tutorial for explaining how to use the GUF Tool.

One of the most valuable results of the LIFE FUTURE project corresponds to the definition of the environmental criteria and product types for Urban Furniture. This work consisted in a deep analysis of available criteria in order to reduce and to explain them in detail. In addition, they have been correlated to different urban furniture products.

Furthermore, Life Cycle Assessments (LCAs) were conducted for several urban furniture products. Results from these assessments were obtained following a scientific methodology, but in-depth conclusions were not straightforward when comparing them: environmental impacts for each product do not offer a friendly comparable data. Indeed, and because of the complexity on developing a harmonised methodology, the LIFE FUTURE project was delayed in time, then needed for an extension. This fact allowed the consortium to develop a methodology for simplifying the environmental evaluation of urban furniture just providing a single environmental score for each product.

This scientific approach was carried out by means of the TOPSIS methodology<sup>2</sup>: the seven environmental impact categories initially used in LCA eco-profiles (based on CML method) were aggregated into only three impact categories (based on ReCiPe method), which in turn were aggregated through mathematical modelling (using the TOPSIS method) into a single environmental score. This single score is automatically calculated by the GUF Tool so users can perform decision making in an easy, objective and transparent way: public bodies evaluating the products offered to a tender in which environmental criteria are asked, have a user-friendly screen for comparing the scoring of the products of the same category, without any subjective contribution; besides, urban furniture providers can even evaluate the environmental score of their products comparing to the others applying for the same tender, but no one can see which the competitors are, as they appear as just numbers but not the company names.

---

<sup>1</sup> To be finally hosted in a permanent server: access is guaranteed from the LIFE FUTURE official website

<sup>2</sup> R. Vidal, N. Sánchez-Pantoja; “Method based on life cycle assessment and TOPSIS to integrate environmental award criteria into green public procurement”; Sustainable Cities and Society 44 (2019) 465-474; DOI: 10.1016/j.scs.2018.10.011.



In addition to these main results, the GUF Tool was used to perform virtual and, even most interesting, real public purchases.

From the virtual tendering processes, guidelines for prescribers and providers of urban furniture products were produced, then completing the procedure deeply described on the manuals and video tutorials for using the GUF Tool. Virtual testing and GUF Tool evaluation with real manufacturers conduct in the inclusion of templates for justifying the criteria their products met, in addition to improve the GUF Tool contents and functionalities.

For the part of real procurement processes, they conclude in 78 products acquired by local municipalities being beneficiaries of the project: València and Koprivnica. Urban furniture products with lower environmental impacts have been effectively acquired by municipalities. When reviewing the environmental saves, the LIFE FUTURE project contributed to reduce the global warming, energy consumption and raw materials usage by reducing CO<sub>2</sub> emission by 40%, waste generation reduction by 56% and saving in fossil resources by 40%.

Overcoming the delay in the development of the GUF Tool, and taking advantage of the amended extra time, the GUF Tool was presented and promoted among different key actors, both public bodies and manufacturers. Two capacity building seminars were conducted in València and Koprivnica each. These capacity building seminars allowed getting extra feedback and networking for the GUF Tool to be widely used along public administrations.

As an overview, the LIFE FUTURE project conducted the following activities for boosting the sustainability of urban furniture through green public procurement processes:

- 1- Technical updating to identify the in-force legislation and to collect environmental information available for urban furniture, among different sources and institutions. EU GPP Toolkit and EU legislation were in depth analysed
- 2- Identification of the products of interest falling under the category of "urban furniture", then classifying and grouping them in just 15 different categories. Energy consuming products were not considered
- 3- Development of a database with green public purchase criteria and environmental profiles for these urban furniture products. Updated references were compiled in just 19 criteria: both the definition, the explanatory information and the verification proofs were deeply described. More than 20 different products falling under the 15 categories of urban furniture were environmentally assessed
- 4- Graphical design and functionalities implementation of the GUF Tool. The online tool is fully operative and user-friendly for creating, validating and consulting tenders for urban furniture products in which environmental criteria are included.
- 5- Developing an environmental assessment multiple criteria decision-making method for obtaining single scores to evaluate criteria for green public procurement using a scientific approach. Objective and transparent assessment is provided for evaluating and comparing the offers applying for the tender of interest.
- 6- Demonstration and validation of the tool through virtual and real tenders: benches and playgrounds were the selected products for the virtual tendering process, while benches, bins and flowerpots were purchased in València (Spain) and Koprivnica (Croatia).

## 4. Introduction

### 4.1. Background, problems and objectives

Green Public Procurement (GPP) is an important market-based instrument to contribute to the general goal of sustainable development and accelerate the progress towards a resource efficient economy, since it enables public authorities to acquire more environmentally friendly products and services. This allows to reduce energy consumption and GHG emissions, prevent the use of hazardous substances and waste generation, while promoting eco-innovation and green technologies in business, thus leading to benefits in diverse environmental areas, like climate change, acidification, eutrophication and resource depletion.

GPP requires to include clear and verifiable environmental criteria for products and services in the public procurement process. To this end, the European Commission is continuously developing voluntary GPP criteria for different product and service categories, but the uptake of these EU GPP criteria by public authorities is still limited in many EU countries (Figure 1).

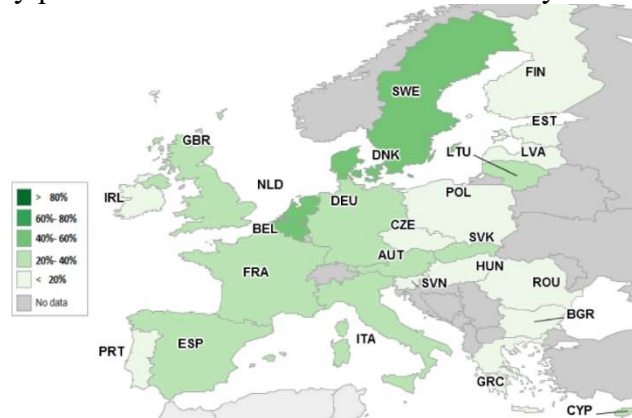


Figure 1. Level of EU GPP uptake for ten product/service categories in the EU27.

The use of environmental criteria varies between product/services groups: some of them show a wider uptake of GPP criteria, like transport, cleaning services and products, copying and graphic paper, and office IT equipment; while other products and services have a much more limited uptake nowadays, such as furniture. Environmental criteria usually include environmental policy, environmental management systems, material choice, chemical content, recycling systems, and so forth. Many public authorities find difficulties to include these criteria in public procurement due to their limited knowledge on environmental matters.

LIFE FUTURE project addressed this problem and promotes GPP, focusing on the urban furniture sector, by providing an easy-to-use online tool for: (1) helping users to understand GPP criteria, (2) encouraging public bodies to include green clauses in their public tender documents, and (3) assisting them in the procurement of the best urban furniture products in terms of GPP. The GUF Tool will guide users throughout the whole tender process, from the generation of the environmental clauses that they can include in their call for public tenders to the comparative environmental assessment of the offers received. The tool will rely on GPP criteria (aligned with the EU GPP criteria) for the generation of environmental clauses, while the comparative environmental assessment will be based on the LCA methodology.

The use of the GUF Tool and the derived environmental benefits was demonstrated in the project through real procurements conducted by partners being public bodies. The City Councils of València (Spain) and Koprivnica (Croatia) used the tool for the procurement of urban furniture items. Environmental benefits derived from GPP using the tool are related to the reduced



environmental impacts of the urban furniture products purchased. The expected reduction of environmental impacts is estimated (as a canopy study used as a base of the study<sup>3</sup>) at:

- 26.5% for climate change
- 28.7% for acidification
- 25.5% for eutrophication
- 15.5% for energy demand
- 10.8% for waste generation

The LIFE FUTURE project implemented a comprehensive communication and dissemination plan with activities aimed at target stakeholders, including public authorities, urban furniture manufacturers/suppliers and key organizations. They were being encouraged to use the tool for greening their procurement procedures (in the case of public bodies) or the development of their furniture products (in the case of manufacturers). The objective of engaging these stakeholders in the project is to contribute to the sustainability in urban environment in line with EU environmental policies and legislation, as follows:

- Contributing to a better implementation of existing EU policies and legislation promoting GPP by supporting local authorities to adopt a more integrated approach for green procurement.
- Contributing to green urban infrastructure by encouraging public authorities to acquire more environmentally friendly urban furniture through a systematic GPP procedure.

#### 4.2. Expected longer term results

The reduction of environmental impacts is directly related to the LIFE FUTURE project objectives and results. This reduction can be more significant in the longer term if a successful transfer of the project outcomes to different public authorities is achieved. It should be noted that public procurement represents about 19% of the EU's Gross Domestic Product, so that the replication of project outcomes by public authorities across the EU can result in great environmental benefits.

If the GUF Tool will be applied for the procurement of 16,659 urban furniture items during 5 years after the project end (3,332 items/year), the environmental savings pre year would be, as the real results obtained after the LIFE FUTURE project procurement compared to a reference bench made of concrete (see section 7 for more details):

- Reduction of climate change by 15.16 tonnes CO<sub>2</sub> eq/year
- Reduction of acidification by 0.01 tonnes SO<sub>2</sub> eq/year
- Reduction of eutrophication by 0.09 tonnes PO<sub>4</sub><sup>3-</sup> eq/year
- Reduction of energy demand by 30.96 MWh/year
- Reduction of waste generation by 5.56 tonnes/year

Therefore, the transfer and replication of project outcomes is crucial for multiplying the environmental benefits, both at the public and private level. As the number of public authorities implementing GPP increases, it will also increase the number of manufacturers and suppliers applying eco-design and other best environmental practices for the development of environmentally sound goods. For this reason, LIFE FUTURE partners are investing great efforts to effectively communicate and disseminate project outcomes among key stakeholders like

---

<sup>3</sup> "Llibre didàctic d'anàlisi del cicle de vida (ACV)"; Xarxa Temàtica Catalana d'ACV; Rita Puig ([https://tecnologiaisostenibilitat.cus.upc.edu/continguts/analisi-de-cicle-de-vida-acv/8.-bibliografia/llibre\\_acv.pdf](https://tecnologiaisostenibilitat.cus.upc.edu/continguts/analisi-de-cicle-de-vida-acv/8.-bibliografia/llibre_acv.pdf))



public authorities and furniture manufacturers, with 39 official stakeholders engaged in the project. Moreover, the LIFE FUTURE project can contribute to support the development or update of environmental policies and legislation for a wider and more effective implementation of GPP at the EU level, considering the technical and scientific progress achieved with the project.





## 5. Technical part

### 5.1. Technical progress

#### Identification of urban furniture elements and selection for demonstration

##### Outputs achieved

- Identification and classification of urban furniture products.
- Characterisation of the different types of urban furniture products identified, including technical and environmental characterization, functionality and current market.
- Selection of two urban furniture products that were further used as demonstrators.

##### Main results/Conclusions

This action led to the following main results and conclusions:

- 1) The GUF Tool deal with fifteen different urban furniture products categories, which can be grouped in three product types as follows:
  - Street furniture products: (i) Benches, seats and chairs; (ii) Bicycle parking; (iii) Canopies and kiosks; (iv) Bins and containers; (v) Advertising and information panels; (vi) Planters and pots; (vii) Tree pits, manholes and lids.
  - Recreational and leisure products: (viii) Playgrounds; (ix) Sports courts; (x) Showers and footbaths; (xi) Fountains and hydrants.
  - Traffic management products: (xii) Traffic signs; (xiii) Guardrails, barriers and parapets; (xiv) Milestones and bollards; (xv) Speed reducers.
- 2) Urban furniture products consuming energy are outside the scope of the project and they were not be assessed using the tool.
- 3) All the above urban furniture products were characterised in terms of the materials and processes used for their manufacturing and the technical specifications required, including mechanical, chemical, biomechanical and environmental properties. Other key aspects such as functionality and current market were also reviewed. This knowledge was used for the selection of the demonstrators, and it will be useful for the development of the tool.
- 4) The criteria used for the selection of the demonstrators included: design opportunities, environmental aspects, functionality and current market. The furniture products that better comply with all these criteria were selected: (1) benches, seats & chairs, and (2) playgrounds.
- 5) The procurement procedures applied in that period by City Councils of València and Koprivnica hardly consider environmental aspects of products (at least explicitly and as a key factor with impact on the purchase decisions). These procedures were basically focused on economic costs without applying a life-cycle costing approach; i.e., only purchasing and installation costs were accounted for. Some technical aspects with potential environmental implications were included as procurement criteria (e.g., improvements in performance offered) only if they do not involve extra costs for the City Councils.



## Development of a database with GPP criteria and eco-profiles for urban furniture

### ▪ Output achieved:

- GPP criteria for Urban Furniture updated, extended and reviewed
- LCA-based factors (eco-profiles) for materials related to urban furniture products completely defined and collected
- Complementary eco-profiles for manufacturing/processing, energy consumption, wastewater treatment, packaging, transportation and end-of-life processes, related to Urban Furniture, were also collected or even calculated.
- Life Cycle Assessment of 23 Urban Furniture products

### Main results/Conclusions

This action led to the following main results and conclusions:

- 1) GPP criteria for urban furniture including verification requirements and explanatory information, which are mainly based on the updated versions of EU GPP Toolkit and complemented with criteria from other sources (ICLEI, Pianoo Project, EPA, Umweltbundesamt, ecolabels, etc.). The European Commission published on August 10, 2017 a new set of GPP criteria for furniture as part of the EU GPP Toolkit. This permitted to update the database of the tool with new relevant criteria from the latest EU GPP Toolkit version, such as restrictions for metals, REACH restrictions, fitness for use, design for disassembly and repair, product warranty, weight or volume reduction by product design, etc.
- 2) GPP criteria are classified into:
  - Mandatory criteria or “specifications”: tenders of urban furniture products that do not meet the “specifications” will be rejected.
  - Voluntary criteria or “awards”: tenders of urban furniture products that meet the “awards” will obtain extra points. The score for each award criterion (e.g., percentage of recycled materials) depends on several parameters (e.g., effects of each material and recycled content on the environmental impact of the final furniture product). The score system is based on the results of the LCA studies (Action B1) and processed by means of the mathematical model based on the TOPSIS approach.
- 3) Eco-profiles for other contributions than materials were proposed for performing the Life Cycle Assessments of the selected Urban Furniture products
- 4) LCA studies dealing with 23 urban furniture products belonging to 8 different product types and covering various materials and processes were conducted once collected all data needed. Results varied significantly between products depending on the materials and processes involved, but some important trends were found: (1) most of the environmental impacts of the products are due to upstream processes, which include extraction & processing of raw materials and energy consumption for the manufacturing of components; (2) impacts associated with transport of materials/components and waste are not significant compared to other life-cycle stages; (3) environmental impacts of the manufacturing of products are usually low compared to the impacts of the materials used (upstream processes); (4) environmental impacts of End-of-Life vary significantly depending on the product and the waste treatment scenario: recycling impacts positively on the environmental impacts reduction. The results of the LCA studies were used in Action B2 to simplify the GUF Tool in a way that the



environmental assessment method is executed on the back-end of the tool to provide a single environmental score to the user.

- 5) Difficulties in comparing results from LCA of Urban Furniture Products, even within the same category, based on the seven categories of environmental impacts forced for a review on the method of showing this comparison inside the GUF Tool. It was finally decided to apply a single-score approach (TOPSIS) to ease decision making for users. This fact delayed the completion for Action B2 and the following related actions.

## GUF Tool design

### Outputs achieved:

- Design and programming of GUF Tool framework
- Action B2.1. Improved and updated GPP criteria description and correspondence with the checklist document contents to verify the agreement with GPP criteria.
- Programming the GUF Tool's dedicated section for posting tenders and consulting those available, which is also the platform for submitting offers.
- Action B2.2. Implementation and programming of the calculation methodology applying TOPSIS to environmentally assess products submitted through the GUF Tool.
- Programming the GUF Tool's personal area for managing documentation and data.
- Design manuals and video tutorial for using the GUF Tool
- Accessible GUF Tool fully operative with all features implemented

### Main results/Conclusions

This action led to the following main results and conclusions:

- 1) The GUF Tool is ready to use with three main modules (functionalities): (1) GPP criteria (search, selection and documentation generation), (2) Biddings (including search for available tenders, bidding/offering submitting process); (3) User manual (on-line/downloadable and video). Additionally, a personal section (MyMenu) is available for user to manage their data.
- 2) Verification requirements for urban furniture manufacturers/suppliers are also stated for each criterion. Indeed, verification documents shall be uploaded to the GUF Tool when a provider apply for a tender. Templates for verification documents requiring a signed declaration for the provider are also available inside the GUF Tool. These templates have been developed as fillable PDF ready to use electronically inside the GUF Tool.
- 3) GPP criteria module helps users to obtain the environmental criteria and a checklist to verify the products comply with them. The criteria can be searched by materials or by products and the GUF Tool has additional information available on concepts that may not be familiar to users. Indeed, this module was set as the DEMO version (Action D5) of the GUF Tool as soon as it was optimised (on February 2018).
- 4) Module for product evaluation includes both "specifications" and "awards". Two levels are defined for each posted tender: Silver GUF level includes only "specifications" whilst Golden GUF level includes "specifications" and "awards". The Golden GUF level tender allows to evaluate the environmental impact of each product based on the "awards" inputs.
- 5) TOPSIS is applied to endpoint impact categories for each product to obtain only a single environmental score (and not seven or three impacts as previous approaches internally discussed in Action B1). Scores are in the range 0-100. Scores for different products are



presented graphically to ease the comparison for the bidder who posted this tender. Manufacturers who submit an offer for a specific tender will receive the scoring for its product after submitting the offer.

- 6) GUF Tool, user manuals and the video tutorial are available in English, Spanish and Croatian.
- 7) 158 users are registered in GUF Tool (data accessed 31/12/2018) but last update available on May 2019 presents the last user has the 255 number

## Demonstration and tool validation

### Output achieved:

- Virtual offers for validating the functionality of the GUF Tool were conducted for benches and different playground equipment with the data coming from companies manufacturing them
- Real purchases of urban furniture by means of using the GUF Tool have been conducted both in València and Koprivnica.

### Main results/Conclusions

AIMPLAS and AIJU are implementing the different products applications getting information from providers. Preliminary environmental scoring for some of the market options with the available data are being obtained. Low feedback is being obtained from providers, nor for direct request of data neither for offer submitting through the GUF Tool.

The timing for the city councils for performing public procurements did not fit with those related with the development of the GUF Tool. Even when the GUF Tool was not completely ready at the time the first real purchase for València occurred, GPP criteria were used in the tender. Once the GUF Tool was ready, new public procurement was not ready before the project ends.

On the other side, budget for public purchasing was not enough for covering all products intended to be purchased. City Council of Koprivnica made great efforts to promote public procurement of urban furniture through the GUF Tool before the project ends, but items were not fulfilled in quantity.

#### 1) Virtual tender of benches:

All applicable criteria were selected for creating the virtual tender on benches, for ensuring 18 seats available. This fact allows for fitting the suitable combination of available and yet assessed benches: 6 benches of three seats, 9 benches of two seats, other combinations of benches for 1, 2 and 3 seats...

Additional info was attached to the offer just for clarifying this is a TEST and this was sent to providers in order to make them to test the GUF Tool. There was not any answer to this call, but data for different benches were obtained from the LCAs conducted on them.

Intentionally, in addition to those benches with LCA data, La Ribera bench was assessed with the GUF Tool. Compared to others, this bench, as it is made of partially with steel and not only recycled plastic has less scoring than those made of exclusively recycled plastic. On the contrary, wood-based benches perform the worst and concrete bases on the top. The second is due to the higher span life; however, these are not designed for repairing then they cannot fulfil with mandatory criteria.

#### 2) Virtual tender of playgrounds:

Three different products belonging to the same urban furniture category of playgrounds were simulated in the GUF Tool, as three different procurements: a climbing structure, a house and a seesaw. The procedure consisted in creating a user as public administration and following the user's manual generate these three offers. These three offers were labelled as Gold GUF, thus, in addition to the legally binding specifications for each type of product, the environmental requirements of the products that opt for the offers are also scored, thus enhancing the green public purchase. These criteria and the check list were created for each tender.

Two suppliers offered products to these tenders. The information provided by the suppliers was the technical data sheets and safety sheets of the selected products, equipment assembly instructions and maintenance details.

Even when the GUF Tool scoring is not as high as for the other simulated products, methodology for selection the proper products based on environmental impacts still works. The low scores are mainly related to the materials they contain and that no other information than extended warranty, regarding awards criteria, was provided.

### 3) Real tenders in València:

Despite to the accumulated delay on the GUF Tool usability, a real purchase has been conducted for 71 benches in València, using GPP criteria coming from the DEMO version of the GUF Tool. Tender is posted in the GUF Tool including the criteria asked for it.

For this tenders, two companies proposed offers for providing the 71 benches. Nonetheless just one of them provided the verification proofs of criteria in addition to the economic offer. Indeed, the company rejected does not fulfil the mandatory criteria ("specifications") so their economical offer was not considered. Then the company fulfilling, and providing evidences of it, was selected for the purchasing.

These 71 benches (Figure 2) were installed along València<sup>4</sup> city.

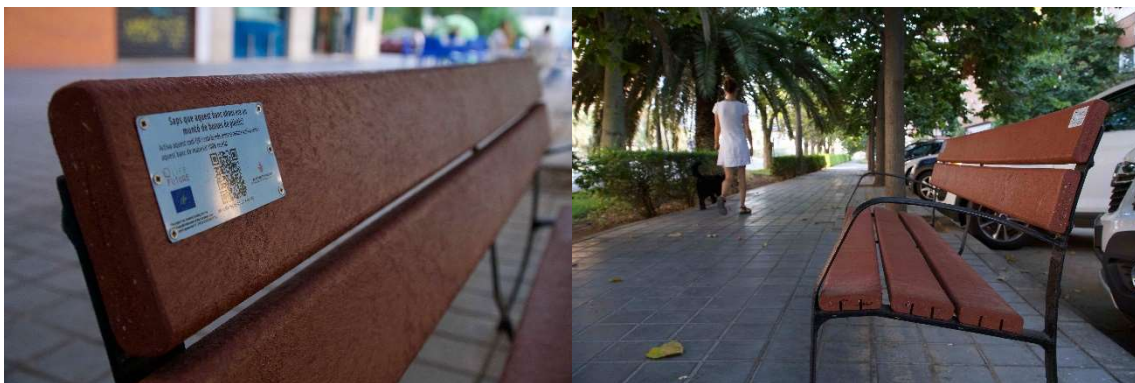


Figure 2. Pictures of the benches installed along València city

Sports department of the Valencia City Council used the GUF Tool to include green criteria as specifications in the tender of the construction site of a square in Dr. Lluch/Bloque portuarios, in València. The procurement of the construction of the whole square (6.000 m<sup>2</sup>) will include 65 items of urban furniture: 23 benches, 2 picnic tables, 3 fountains, 13 bins, 24 children's and gym equipment on the street.

The documentation of the project for this tender is under review, and the tender will be launched in May 2019.

<sup>4</sup> <https://www.google.com/maps/d/viewer?mid=1CXL0cqRGDFjRO-9llqcvg019xJJ7rcJg&ll=39.466919675106084%2C-0.3759068672596868&z=13>



#### 4) Real tenders in Koprivnica:

Koprivnica posted all their tenders in the GUF Tool as a Gold level ones.

In its first procurement, Koprivnica City Council posted the tender processes for purchasing both 10 benches and 30 bins on the GUF Tool (Action B3.1). However, it was cancelled because manufacturers/providers do not wish to use the GUF Tool to apply for the call of tenders.

Selected environmental criteria and checklist for each product were included in the tenders. Other official documentation was provided following Koprivnica's procedure.

Only one company applied through the GUF Tool for the second procurements of Koprivnica City Council, but it made the effort in providing more than one product to the same tender for searching to the best alternative between their products on catalogue.

Koprivnica City Council purchased 2 bins, 2 benches and 3 flowerpots by means of the GUF Tool (Figure 3).



*Figure 3. Urban furniture products procured and installed in Koprivnica city*

The inclusion of environmental criteria for a tender posting process is now easy and straightforward thanks to the GUF Tool, as GPP criteria are well defined and easy to select and generate as a PDF document.

In parallel to this action, both virtual and real purchasing process will serve for the preparation of the Guidelines for providers and prescribers (See Action D5)



## Environmental monitoring

### Outputs achieved:

- Definition of the initial environmental situation of the municipalities
- Definition of questionnaire to be completed by registered users
- Monitoring and data compilation
- Analysis of environmental indicators.

### Main results/Conclusions

Environmental monitoring controls the improvements achieved during the project actions and the changes that project implementation will provide in the future.

A questionnaire was designed by UJI and filled, at the first and at the end of the project, by City Council of Valencia (represented by the partner Las Naves) and City Council of Koprivnica.

At the end of the first phase, in order to assess the environmental performance of the public authorities, the starting point of both municipalities was studied with the initial questionnaires. The two cities showed similar results since specific environmental criteria were not applied in the processes of public procurement of urban furniture. The number of entities involved in the procurement process in the city of Valencia makes difficult the unification of procedures. However, the municipality shows a great potential for improvement in Green Public Procurement. In the city of Koprivnica, the application of sustainable criteria in the public procurement process has so far been difficult given the limited availability of resources.

At the end of the project, the results of the questionnaire were similar to the first one (Valencia) or improved (Koprivnica). Although environmental criteria for the procurement process carried out during this project was really used through the new GUF Tool, the generalised application for all the processes of public procurement of urban furniture requires a period of training and implementation.

Indirect monitoring was carried out through the GUF Tool users, who provided information when logged into the tool. During the project duration, data was obtained from a total number of 133 users registered, 44 of them were prescribers and the rest providers.

To analyse the environmental benefits of the LIFE FUTURE project, two scenarios were considered. One during the execution of the project and the other after project execution, in the medium term.

The environmental savings for each unit or urban furniture were calculated for the products purchased by València and Koprivnica. The range of improvement is good: 30-38% of the endpoint indicators and 40-56% for the midpoint indicators (except for eutrophication with only 12%).

The scenario that assumes the use of GUF Tool in the mid-term was designed with the local administrations interested in the project through a letter of support or through registration on the web, counting for almost 2.5 million of inhabitants.

The green criteria of the products selected by València and Koprivnica were recycled material and extension of the lifetime, with direct consequences in the reduction of waste. In addition, the extension of the lifetime and the purchase of local products have positive effects in the reduction of energy consumption.

The global achievement of impact savings during project execution is very low. The real number of items procured is less than the planned number and the items procured have, by defect, low environmental impacts. However, in percentage, interesting achievement were obtained.



A good environmental achievement will be reached after project execution if the same products procured during the project are forecasted considering the total number of inhabitants of the local administrations interested in the LIFE FUTURE project.

## Socio-economic monitoring

### Output achieved:

- Socio-economic data 1<sup>st</sup> compilation from urban furniture manufacturing companies.
- Preparation of the final conclusions of the socio-economic situation of the urban furniture sector.

### Problems encountered:

Socio-economic changes due to green public procurement do not happen as fast as expected. The using of the GUF Tool is ongoing, and first urban furniture tender in the Valencia city council using the environmental criteria of the GUF Tool did not produced any significant change in the supplier chain: no new workers have been hired (because of the size of the procurement is limited) and its turnover has not been modified in terms that may be considerable for statistical purposes.

### Main results/Conclusions

Socio-economic results from answered questionnaires have been obtained and initially grouped for València and Koprivnica

The initial situation should be compared to measure the impact of the green procurement in the economy. This monitoring depends on the intensive use of the GUF Tool that is in progress. The impacts on socio-economic data will not be so visible in the short time, although the inclusion of green specifications on tenders should lead to socio-economic improvements in companies as it is targeted by European Union.

For long-term socio-economic benefits, it has to be known that budgetary dedication for public procurement of urban furniture is a number that is not available in the Valencia city council. Koprivnica has a planned budget for 2019 for public procurement and urban furniture: 21,500.00 EUR. It can be considered that similar budget will be planned also in upcoming years for Koprivnica.

Even when long-term economic impacts are expected, for maintenance and re-designing the GUF Tool, a dedicated person should be hired.

Furthermore, because of manufacturers of urban furniture are being involved also in greening their products, more personnel are being incorporated to these SMEs for covering the increasing demand in products made of recycled plastic, for instance.





## Regulatory monitoring

### Main results/Conclusions

Spanish law for public procurement is in force since March 9, 2018. In addition, an internal commission has been created for the Spanish government to include and use ecological criteria in public procurement.

In addition to the update of GPP EU Toolkit for furniture on August 2017, paints and vanishes criteria, among others, were also updated in 2018.

EU strategy for improving Circular Economy is also being present in public procurement.

Last update from December 2018.



## Dissemination Plan

### Outputs achieved:

Action D4.1: Dissemination Plan design: The plan has been designed and distributed among the partners and has been made available on the partners' space of the website in May 2016 after final discussion during the first dissemination group meeting in Koprivnica in April 2016.

Action D4.2: Dissemination Plan Execution: All the partners followed the plan. Meetings were being held every 3 months to make sure that all partners were on tracks regarding dissemination activities. ACR+ coordinates the monitoring of dissemination activities from project partners.

Action D4.3: Information and merchandising products: LIFE FUTURE **leaflet** has been designed and translated into English, Spanish, Croatian and Valenciano in order to achieve the project objectives of dissemination. In addition, factsheets were produced and made available in English, Spanish and Croatian. It gathers a short introduction to the project, an overview about its progress and the most relevant information regarding on the on-going activities (such as a list of upcoming events, workshops, latest publications). 4 factsheets have been published throughout the project in April 2016, April 2017, Mars 2018 and October 2018). A final version was published in December 2018, at the end of the project presenting the main outcomes and deliverables. The project **Newsletter** was published on 21/4/2016, 22/9/2016, 12/04/2017, 10/03/2018, 22/10/2018. The LIFE FUTURE project is also disseminated on **partners' websites** and via different **Social Networks**, namely LinkedIn, Twitter and the Procurement Forum. To announce the launch of the project and latest activities **press releases** have been sent by the partners and were used and circulated by different newspapers.

### Main results/Conclusions

209 target agents identified and contacted, of which 121 public authorities
49 events participated in (conferences, meetings, workshops and seminars).
185 organizations already contacted
Design and publication of project leaflet and factsheets completed. Dissemination during events organized or attended by partners. Project factsheets have been realized and publish regularly to represent up-to-date progress of project activities
– 74 articles in total 4 press releases: AIMPLAS – 04/10/2015 ACR+ - 06/10/2015 Las Naves – 18/04/2016 AIJU – 18/05/2016
AIMPLAS 17/12/2015; AIJU 01/03/2016; Las Naves – 27/04/2016; AIJU 01/04/2016; UJI 16/04/2018; UJI 05/11/2018
5 project newsletters – sent to 603 recipients. 5 <sup>th</sup> newsletter published in October 2018
5 news regarding LIFE FUTURE project milestones published on the website
5
Regular updates of social media pages on Facebook, LinkedIn and Twitter's accounts of partners (about 100 posts on social media)

The dissemination activities have been implemented according to the plan agreed by the partners and the objectives in terms of communication have been reached on a quantitative point of view. To be noted, several articles published by Spanish media were based on partner's press release. All partners are actively participating in the project dissemination activities. Attendance of project partners to fairs, technical conferences and seminars, has already overcome the



performance indicators planned for the whole project cycle. Networking activities have been carried out according to the project planning, and results by already overcome results indicators planned for the whole life cycle.

It is worth to mention that partner Las Naves, with the contribution from all partners concerning subtitles translations, produced a short video about the project<sup>5</sup>, which represented a solid and efficient dissemination tool.

## Awareness and capacity building

### Output achieved:

- DEMO version of the GUF Tool (Action D5.2) is replaced by the final fully implemented version
- Four Capacity Building Seminars (Action D5.3) conducted:
  - València: 23/10/2018 & 11/12/2018
  - Koprivnica: 15/11/2018 & 29/11/2018
- Implementation Guidelines were produced for manufacturers and authorities.

### Main results/Conclusions

City of Koprivnica organized two capacity building events. The dates of the events were 15/11/2018 and 29/11/2018.

City of València organized two capacity building events. The dates of the events were 23/10/2018 and 11/12/2018.

Topics that covered by seminars were:

1. Presentation of general frame of the national law regarding green public procurement
2. Presentation of the LIFE FUTURE project
3. Presentation of the GUF Tool (project video and overview of the GUF Tool)
4. Practical work / training how to use GUF Tool

Well-structured user manual available in three different languages will serve as a base for providing the training material for the servants.

Live feedback was useful for completing the Guidelines and also for monitoring purposes.

- València: attendants think that the GUF Tool is useful, but it does not fit 100% to the kind of tenders that València city council prepare. The GUF Tool is more likely to be used by a Central Buying Service.
- Koprivnica: attendants concluded that the GUF Tool is a little bit complicated and need a lot of time to make statement

---

<sup>5</sup> <https://www.youtube.com/watch?v=tkOZO1M5ru0>



## After-LIFE

### Outputs achieved

The project website will be active during 5 years after the end of the project which means December 2023.

All the dissemination material generated along the project implementation will be used for the activities planned.

Seminars, workshops, fairs and congress have been identified and LIFE FUTURE will be participating.

Two technical publications are foreseen in the general media press or in the sectorial publications.

As part of the actions will be to send the layman report to different stakeholders and organise at least twice a year a conference call with all the Consortium partners to monitor and address the dissemination tasks.

### Main results/Conclusions

As a result of the exploitation of the results ACR+ and Koprivnica agreed on transferring the GUF tool access rights to AIMPLAS in order to exploit it. Nevertheless, AIMPLAS is open to collaborate with them in those projects where the GUF tool could be used and in case some of ACR+ local authorities' members are interested in testing the tool, it will be available for them.

An Exploitation Agreement is being negotiated with the rest of the Consortium.

A new project proposal was submitted to the local Valencian Government in which it's intended to evolve and continue a joint development. In case of approval, the scope of this grant would be limited to 12 months.



## Networking with other projects

### Output achieved

Partners prepared the field for an efficient networking with other projects by preparing activities and establishing first contacts. A part on synergies and networking was included in the Dissemination Plan in order to create a good ground for synergies and planned future activities. Following the approval and publication of the Dissemination Plan, partners have started executing the part regarding networking. To this aim, partners created and got in touch with a list of potential stakeholders, coming from their own contacts, or through any of the dissemination activities to be carried out within the project framework.

Relevant organisations have been identified with inputs from all partners and gathered in a list. First contacts have been established by the partners with some of the contacts of the list. Similarly, relevant EU-funded projects have been identified and gathered to create specific synergies. During first 24 months of LIFE FUTURE project activities, project partners took part in various relevant conferences and workshop to ignite a dialogue on introduction of green clauses in public procurement procedures.

Starting from March 2018, immediately after the publication of the GUF Tool demo version, the project partners, under the coordination of ACR+, identified 30 different actors involved in the development of green public procurement policies. The choice of the actors to be contacted followed two main criteria: consolidated experience in procurement processes; and sensitivity to the introduction of green/circular public procurement criteria, developed through participation in thematic international projects.

The project partners sent contact persons personalized letters including: a short presentation of the LIFE FUTURE project; a presentation of the GUF Tool's functionalities, together with an invitation to test the tool in demo mode; a short questionnaire on the criticalities of introducing green clauses into public procurement processes in their organisation.



## 5.2. Evaluation of Project Implementation

Main objective of the LIFE FUTURE project was to develop a fully operative online tool for facilitating the public procurement of urban furniture products including environmental clauses to be considered as green public procurement (GPP). This GUF Tool is now operative and provides detailed explanation on the environmental criteria applying for urban furniture products. In addition, the GUF Tool provides the framework for the public administration to create and post the criteria applying for procuring a product (or set of products) of urban furniture. Furthermore, it serves as the proper platform for suppliers and manufacturers of urban furniture to apply for active tenders. The GUF Tool then provides the environmental assessment of these products, so suppliers of urban furniture can evaluate how environmentally friendly their products are compared to the competitors. Finally, the GUF Tool makes this environmental evaluation in a transparent and objective way, then facilitating the selection of the best suitable urban furniture product from the green point of view of the GPP. And all of this is made under a user-friendly platform and with just couple of clicks.

For achieving such a complete tool, deep review of environmental criteria applied to urban furniture products, including related legislation, was performed, then allowing to reduce the wide different (and sometimes complicated to understand) criteria into just 19 criteria. These were also divided into mandatory and voluntary. Besides, urban furniture products were reviewed then grouped in 15 categories. As a result, these 19 environmental criteria were assigned to each of the 15 product categories depending on their potential applicability: users can select the urban furniture of interest and it directly comes with the potentially applicable environmental criteria to be further selected (or not) as required for public call of tender.

In that sense, the actions involved in the proposal for reviewing and updating urban furniture environmental problems, and for identifying the products of interest, were fully conducted to obtain the base for boosting GPP in Urban furniture.

On the other hand, environmental assessments were conducted for more than 20 different urban furniture products. Scientific and standardised procedures were followed for obtaining reliable results, both combining primary data from urban furniture manufacturers and secondary data based on available environmental assessments of raw materials, processes and other blocks needed for doing so. Results showed that comparison of environmental impacts is not straightforward and that a simplified methodology should be applied. Intensive research produced a methodology for grouping these impacts in a single score by the TOPSIS approach. This high-quality work was also published in a scientific peer-reviewed paper, and it is used on the back-end of the GUF Tool for providing single scores to environmental assessment of urban furniture.

These intensive tasks supposed the application for an amendment in time for the project to be successfully concluded.

Because of this extension, the GUF Tool is now providing a scientific-based environmental analysis for urban furniture products in a simplified way for non-expert users, who better understand the environmental impacts of a product in a 100-points scale.

The combination of the definition of urban furniture products and their applicable criteria with the user-friendly result coming from a scientific environmental assessment, allowed to design the GUF Tool for overcoming difficulties for GPP responsibility with the criteria they shall apply and for assisting them to select under objective results the best option that fits better with the asked criteria. Even when criteria are clearly defined inside the GUF Tool, the easy-to-click process allows responsible for the GPP to conduct the selection of the criteria easily, as previous



difficulties are not existing anymore when selecting which criteria applies for a selected urban furniture product.

In addition, environmental assessment performed on different real products, allowed to quantify and review the environmental impacts of the project.

As discussed along the report, LIFE FUTURE beneficiaries made a great dissemination task aiming for extending the use of the GUF Tool across Spain and Croatia, but also beyond these countries along EU. Networking with stakeholders, municipalities, private companies and other projects dealing with public procurement was deeply conducted. Nonetheless, responses from other key actors out of the stakeholders' list was not as high as expected. There still exists a gap for environmental criteria to be applied on public procurements as legislation do not force to do so. This fact makes that public procurement is done following the protocols implemented on each institution internally and there is no room for further improvements or changes.

Language barriers also appear when trying to replicate the GUF Tool to other regions. Environmental criteria are difficult to understand by most of the people in charge of public procurement, as they are not experts on it. In addition, municipalities are used (and sometimes forced) to use local languages for doing public procurements. Then, even when the GUF Tool is fully implemented in English, it could be a barrier to be overcome by other countries: Spain and Croatia have this idiomatic barrier solved.

National legislation, in Spain and Croatia, related to public procurement, recently approved or modified, is not aligned with the inclusion of environmental criteria in a harmonised way. Some of them recommend including environmental criteria, but they are focussed on product not being urban furniture: energy and computer/telecommunication products are then referred but focussed on energetic impacts. On the other side, many other criteria are being proposed to be included in public procurements and contracts: social, ecologic, sustainable, innovative, green... Even when environmental criteria are used for these, there is not a clear strategy for environmental criteria neither for using them in public procurement of urban furniture products.

Despite all of this, the GUF Tool developed on the LIFE FUTURE project allows boosting the GPP of urban furniture by the easy inclusion (and assessment) of environmental criteria on the products aimed to be purchased. The GUF Tool could be used outside Spain and Croatia as it has implemented the English version: it could be useful when the legislation forces to use environmental criteria on procuring urban furniture.

By doing so, public procurements of urban furniture products help to achieve sustainable growth and circular economy: resources are better managed, wastes are reduced, span life is increased, green jobs are created, and so on.

The environmental assessment of the products procured by using environmental criteria through the GUF Tool were also obtained at endpoint values. These deal with human health, ecosystems and resources. These results highlight the benefits to the quality of life that environmental criteria applied to urban furniture can produce if they are massively implemented on these products. Indeed, the need for greening these products will involve also the creation of green jobs for covering these demands. Thus, all together contributes to the sustainability of this sector, considering both economic, social and environmental benefits.





### 5.3. Analysis of benefits

The LIFE FUTURE project allowed to conduct real public purchases of urban furniture products by means of evaluating environmental criteria. The tasks carried out by the whole consortium and under specific approaches allowed to provide benefits according to the following.

#### 1. Environmental benefits

Environmental impacts savings coming from the project are directly related with the number and type of urban furniture products purchased and the potentially items to be procured.

##### a. Direct / quantitative environmental benefits:

As for the end of the project, 78 urban furniture products were effectively purchased in both City Councils involved to do so. It was not possible to cover the expected 200 items: budgetary constrictions, extended time for procuring and managing limitations existing in the company in charge of performing the public procurement, for instance, arose. Small cities like Koprivnica do not have needs for replacing urban furniture as in huge amounts, then budgets are small and there is not the need for a public process to doing so. In València, despite to the fact to be a bigger municipality, different departments are involved in public purchasing of urban furniture for the city and, commonly, these products are tendered together in bigger proposals, consisting of urbanisation of some areas of the city. For those reasons, GPP on urban furniture was not easy to implement along the LIFE FUTURE project: there were two more procurement conducted, one at each city, but results were negative or non-solved, as explained in previous sections.

Even with this, two different procurements were successfully conducted for València and Koprivnica. The first acquire 71 benches and the second, 2 bins, 2 benches and three flowerpots. Considering the methodology for calculating environmental savings based on the TOPSIS approach, described previously, the following (Table 1) were obtained as described on the KPIs:

Table 1. Environmental savings achieved after the LIFE FUTURE project execution

Product	City	Acidification	Eutrophication	Global warming (GWP100a)	Energy consumption	Waste
		kg SO <sub>2</sub> eq	kg PO <sub>4</sub> <sup>3-</sup> eq	kg CO <sub>2</sub> eq	MJ	kg
2 Bins	Koprivnica	0.04	0.01	7.32	32.09	0.50
2 Benches	Koprivnica	0.03	0.01	3.55	17.36	1.17
3 Flowerpots	Koprivnica	0.06	0.02	11.00	48.14	0.75
71 Benches	València	1.87	0.22	333.00	2511.63	127.80
<b>Total savings</b>		<b>2.01</b>	<b>0.26</b>	<b>354.87</b>	<b>3365.90</b>	<b>130.22</b>

Obviously, as for the lower number of products procured (78 against 200) and, more important, the different overall impacts of the urban furniture product taken as a reference in the proposal (a bus shelter / canopy) vs real products purchased, gross numbers are not covered with these procurements. Nonetheless, and more important to notice, is that the savings in percentage are much higher than those initially written in the proposal.

The study<sup>3</sup> on which the information of reference for the proposal was extracted, was for a bus shelter (categorised as a canopy). This product is heavier than the heaviest product procured along the LIFE FUTURE project (the bench in València). Then, at least from the point of view of savings on the waste management and environmental impacts ascribed to materials, the gross numbers proposed were higher than those obtained along the project.





It must be considered that environmental impacts are highly dependent on the upstream processes. This means that changes in raw materials or production processes would change the environmental impacts assessed. Thus, reducing one environmental impact may increase other as they are linked. For that reason, even when the percentage savings are fully covered for most impacts, eutrophication is not. Then, some approaches should be done in also improving this fact, by means of looking for materials or processes decreasing this parameter without modifying the others.

#### b. Qualitative environmental benefits

Even when the GUF Tool is focussed on providing environmental criteria for urban furniture to be included in green tenders, the evaluation of the environmental impacts of these products allowed manufacturers to think in how to optimise and boost the green component of their products. Then, it could also provide the base for green private procurement to be conducted: once the sustainability is settled on the environmental commitment of companies, they will ask for more products to meet this.

In addition, it could serve as a preliminary tool to eco-design new products: changes in materials, production processes or even technical design could be tested in advance through the GUF Tool for computing the final score of the new design.

On the other hand, as the environmental criteria are defined also for materials, a combination of materials could be used for showing the environmental clauses of application for procuring other than urban furniture products. The environmental assessment shall not be used, but it could serve as the base for optimising the GUF Tool during the After-LIFE of the project.

### 2. Economic benefits

In addition to the “green jobs” potentially created in companies or public administrations for including these environmental criteria, that will be explained on next section, the need for maintaining, updating and even optimising the GUF Tool may create direct jobs for programmers and graphic designers. Skilled profiles would be asked for these jobs while lower qualified staff will be required for the “green jobs” in manufacturers of urban furniture.

It is not expected to exist an increase the number of the staff in public administration in charge of public procurement, but the methodology to be implemented in public administration based on the GUF Tool could require for an outsourced company to provide the training.

### 3. Social benefits

In order to reduce the environmental impacts for urban furniture products, a change and/or increase of the personnel for a company shall be conducted as the process is greened. Increasing the number seems direct as the demands for more amounts of green products increases. In parallel, as the manufacturing needs for innovation, qualified staff could be demanded. In any case these new staff should be considered as a part of the “green job” created. Considering this fact, these green jobs, as per themselves, trend to stay local as they cannot be outsourced. Besides, when high skills are not demanded, vulnerable people could apply for such job positions so there is an effective reduction of poverty.

On the other hand, when the environmental impacts of the urban furniture procured along the LIFE FUTURE project was assessed, endpoint indicators were also obtained in addition to midpoint ones. Endpoint indicators are related to human health, ecosystem and resources. DALYs (Disability-Adjusted Life Years) represent the years that are lost or that a person is disabled due to a disease or accident. Species.yr evaluates the local species loss integrated over



time. Dollars (\$) represents the extra costs involved for future mineral and fossil resource extraction.

For the different products and the total savings obtained (Table 2), around 30% of human health and ecosystem is improved by means of the purchased products when compared to reference ones.

Table 2. Endpoint savings assessed for the urban furniture products procured along the LIFE FUTURE project

Product	City	Total savings			Improvement		
		Human Health	Ecosystems	Resources	Human Health	Ecosystems	Resources
		DALY	Species.yr	\$	%	%	%
Bins	Koprivnica	1.68E-05	6.38E-08	0.17	26.5	25.9	24.9
Benches	Koprivnica	9.49E-06	6.07E-08	0.15	33.9	28.5	25.4
Flowerpots	Koprivnica	2.52E-05	9.57E-08	0.26	26.5	25.9	24.9
Benches	València	6.10E-04	2.65E-06	11.60	34.4	39.6	30.8
<b>Total</b>		<b>6.61E-04</b>	<b>2.87E-06</b>	<b>12.19</b>	<b>33.7</b>	<b>38.2</b>	<b>30.4</b>

It is then highlighted that environmental savings obtained when green urban furniture products are procured, instead of those with less environmental benefits, also allow to save resources and keep human health and ecosystems.

#### 4. Replicability, transferability, cooperation:

The GUF Tool was validated by Koprivnica in which the procurement is conducted by companies dedicated to procuring these products. In the case of València, this was made by departments on the section intended to procure. The difference from a big city came from that there is not a single department dealing with procurement issues, but each department has its own management. In that sense, the GUF Tool was deeply spread along the departments in the municipality of València by means of the beneficiaries. Stakeholders were aware of it because of the dissemination plan and the dedicated contacts the beneficiaries of the LIFE FUTURE project made. Besides, interest came indirectly from the different publications the consortium made. Capacity building seminars also served to impulse the interest on the GUF Tool among public bodies dealing with public procurement.

As the GUF Tool is fully implemented in Spanish, English and Croatian, first attempt in replicability would be across the municipalities in Spain and Croatia, whilst for the rest of the European Countries in which ACR+ has influence, the English version applies.

As far as green clauses are not yet mandatory to be included in public procurement processes, the GUF Tool will remain under a voluntary pledge for public administrations dealing with public procurement.

A new project proposal was submitted to the local Valencian Government in which it's intended to evolve and continue a joint development. In case of approval, the scope of this grant would be limited to 12 months.

Besides, some users of the GUF Tool claimed about that this could be also used for other than urban furniture products, because the potential applicability is huge.

Most important spreading of the GUF Tool will come when public bodies trust on the results coming from the environmental assessment. This will be done if a mandatory action comes better than voluntary pledges: usually, the person in charge of conducting a GPP follow straight instructions and there is no room for this person to propose new methodologies. Indeed, the risk



of doing this and getting a bad procurement is so high that some structures do not allow such changes.

On the contrary, when a company manufacturing green products find that there are better scored within the GUF Tool, they will be confident to use it. Unfortunately, the final decision lays on public bodies that are normally subjected to internal procedures. Local regulations sometimes limit more the European ones as for widening the use of the GUF Tool.

Synergistic effect could come from the use of the GUF Tool: once a public administration procures a product by means of including the criteria from the GUF Tool and then it evaluates the results, manufacturers would realise about how their products are good or not. This fact could boost this company to improve the environmental impacts of their products for being ready for future procurements done by the same administration. As part of this innovation done on their products, the company could start promoting these results and public administrations could be aware of it. The synergetic effect on public-private benefits would spread the use of the GUF Tool then making it a well know tool for procuring environmental-friendly urban furniture products.

#### 5. Best Practice lessons:

The interrelation with stakeholders for improving the GUF Tool usability was of high interest as they are end-users of the GUF Tool. In that sense, while trying to provide proofs of accomplishment, some stakeholders even proposed their own documents for doing so, even when they said it was an extra task. This fact allowed the GUF Tool to provide these templates for an easy implementation of the proofs.

Local languages are also mandatory and highly appreciated: translation the GUF Tool contents into local languages allowed to make it more accepted by local public bodies and manufacturers. However, the possibility to check available tenders in English allows interested providers from other countries to do so: the GUF Tool is completely functional in language change.

Capacity building seminars and live demonstration of the capabilities of the GUF Tool was of great help for ensuring the tool to be used.

Green clauses are not fully integrated on the procurements. The mandatory requirements still lay mainly on economic: budgets in municipalities and public bodies are highly limiting their inclusion. Legislation should be reviewed to monetise them.

#### 6. Innovation and demonstration value.

The effective purchase of urban furniture products by means of the implementation of environmental criteria from the GUF Tool is the best proof of the demonstration level of the LIFE FUTURE project. Not any direct selection of environmental criteria is currently available for urban furniture products: the GUF Tool has great acceptance by public administrations as they are easily to implement. Novel methodology for environmental assessment also facilitates their comparison, as well as it is produced in an objective and transparent way, with no participation of the administration in the evaluation. In addition, manufacturers also have these results available for conducting innovative actions on their products for reducing the environmental impacts they have.

#### 7. Policy implications.



Main limitation for the application of environmental criteria on urban furniture products does not come from the intrinsic difficulty on understanding and selecting such criteria, but from the non-mandatory nature of them. Price weighting is still the most considered factor in public procurement. This fact is even more accused in smaller municipalities where budgets for urban furniture are more reduced, despite to the fact that for bigger municipalities, these procurements are hindered by bigger contracts involving building or refurbishing public spaces: urban furniture appear as secondary budgets, minor with respect to the overall costs.

Monetisation of the environmental impacts could boost the inclusion of such criteria by a proper evaluation: the GUF Tool could serve as the suitable tool for doing so. Once in regional, national or even European legislation concerning public procurement, the environmental impacts or saving are computed as a part of the economic offer, the scoring obtained by the GUF Tool could be used a transparent and scientific method for assessing the environmental impacts of a product.

## 6. Key Project-level Indicators

Proposal for the LIFE FUTURE project assumed a total purchase of 200 urban furniture products by the end of the project. In addition, 2000 urban furniture were estimated to be purchased annually as a forecast in the proposal text. In previous reports to the EC, the last number (the forecast) was modified to 3,500 per year, assuming that 400 new products would be purchased by the 2 prescribers project partners (Las Naves - València and Koprivnica), 600 products would be purchase by the 6 stakeholders engaged at the proposal (València, Mislata, Onil, Salinas, Alcoi cities and North London Waste Authority), and 2500 new product would be purchased by 50 new stakeholders engaged through dissemination activities. Therefore, the total number of urban furniture items potentially acquired during 5 years after the end of the project, through green public procurements would be 17,500.

These numbers were suggested as an initial estimation. In depth analysis of the municipalities finally engaged to the LIFE FUTURE project, completed with the information coming from beneficiaries, allowed to modify this numbers in a more accurate and realistic forecast. Extrapolated purchased products are 49,978 along 15 years, used as time base according to the lifespan of products of interest. Then, it implies that 3,332 urban furniture products would be purchased per year in the 14 municipalities analysed. Following the same trend, a total of 16,659 urban furniture products would be purchased five years after the LIFE FUTURE project ends.

In that sense, forecasting values described on the proposal and those extrapolated at the end of the projects are quite similar, when comparing the number of urban furniture products potentially purchased on public procurements in the next years.

With respect to the environmental impacts values, in the proposal saving and these values were based on the study<sup>3</sup> of a bus shelter (canopy), as described previously. This product was considered as a reference in the proposal, but the products indeed procured along the LIFE FUTURE project were benches, bins and flowerpots. For that reason, the base line for referring the KPIs for the environmental impacts to was changed into a more realistic scenario, in which an averaged contribution of benches, bins and flowerpots are considered, instead of this bus shelter. As benches, bins and flowerpots are, in average, lighter than the bus shelter, total values for waste, energy consumption and carbon footprint are also lower than those showed on the proposal. However, the most interesting results arise when comparing the percentage of savings that will be obtained by means of purchasing environmentally better products than the base line estimation.



According to these reviewed values, the environmental impacts related to KPIs are compared in Table 3:

Table 3. Comparison of environmental KPIs as the evolution of the LIFE FUTURE project (proposal vs real). Percentages refer to the savings at the end of the project and the forecast for 5 years

<b>3.1 Waste management Waste generation due to public procurements metric tons waste/year</b>					
	Begin	End		Beyond 5 years	
	Value	Value	%	Value	%
Proposal	3,745	3,722	0.62	3,339	10.84
Real	9.92	9.79	1.31	4.35	56.10

<b>4.1.1 Consumption Energy consumption due to public procurements MWh/year</b>					
	Begin	End		Beyond 5 years	
	Value	Value	%	Value	%
Proposal	169,050	167,550	0.89	142,800	15.53
Real	75.89	75.16	0.96	44.92	40.80

<b>8.1.1 CO<sub>2</sub> (mandatory for CCM projects) Carbon footprint (CO<sub>2</sub> eq) due to public procurements metric tons/year</b>					
	Begin	End		Beyond 5 years	
	Value	Value	%	Value	%
Proposal	24,675	24,301	1.52	18,130	26.52
Real	37.71	37.35	0.94	22.55	40.20

As written above, values for waste management, energy consumption and carbon footprint are lower than proposed since the reference product was changed. At the end of the project, however, similar ratio of savings is obtained for the initial proposed and the real implemented solutions. In addition, mid-term savings (in percentage) appeared to be higher than even planned, indicating a proper implementation of the project and validating the GUF Tool as an interesting tool for reducing environmental impacts of urban furniture.

The following tables (not labelled individually) cover the KPI comparison and the corresponding explanations and evidences. Please refer to the webtool for the KPIs.

<b>4.4. Resource efficiency - circular economy Manufacturers of urban furniture No. of companies where green circular economy practices are implemented</b>			
	Begin	End	Beyond 5 years
	Value	Value	Value
Proposal	0	4	350
Real	0	8	350

8 companies directly dealing with green practices formed part of the project as stakeholders: Zicla, Alquienvas, Berlá, CMPlastik, Industrias Agapito, Cervic, SH and Mosser.

<b>3.4 Resource efficiency - green circular economy Green public procurements (each procurement includes at least 50 units of product) No. of circular economy practices implemented</b>			
	Begin	End	Beyond 5 years



	Value	Value	Value
Proposal	0	4	350
Real	0	4	350

Limitations concerning the procurement of urban furniture, deeply explained above, make that the number of products effectively procured were not as high as proposed. However, number of procurements were achieved: Koprivnica made a call of tender which was cancelled and a successful procurement of urban furniture. València, conducted a procurement in the number of proposed products and planned a new one inside a bigger tender.

<b>10.1.1 Duty holders covered Public entities No. of duty holders or "significant"</b>			
	Begin	End	Beyond 5 years
	Value	Value	Value
Proposal	0	1,000	2,841
Real	0	2,841	2,841
<b>10.2 Implication of NGO (mandatory) including interventions supporting EU environmental and/or climate change policies and of other stakeholders (at least one mandatory) NGO No.</b>			
	Begin	End	Beyond 5 years
	Value	Value	Value
Proposal	2	2	3
Real	2	5	5
<b>10.2 Implication of NGO (mandatory) including interventions supporting EU environmental and/or climate change policies and of other stakeholders (at least one mandatory) Local Authorities No.</b>			
	Begin	End	Beyond 5 years
	Value	Value	Value
Proposal	6	6	18
Real	6	14	18
<b>10.2 Implication of NGO (mandatory) including interventions supporting EU environmental and/or climate change policies and of other stakeholders (at least one mandatory) Regional Authorities No.</b>			
	Begin	End	Beyond 5 years
	Value	Value	Value
Proposal	0	1	2
Real	0	5	5
<b>10.2 Implication of NGO (mandatory) including interventions supporting EU environmental and/or climate change policies and of other stakeholders (at least one mandatory) Private companies No.</b>			
	Begin	End	Beyond 5 years
	Value	Value	Value
Proposal	0	2	2
Real	0	4	4

As part of stakeholders LIFE FUTURE project have the following institutions considered as NGO: PEFC, ICLEI, Fondazioni Ecosistemi, Door and UZOR Hrvatske. In addition, up to 14 local authorities were involved (as showed previously for the municipalities for which the extrapolation was done), 5 regional authorities as stakeholders (Generalitat Valenciana, Diputació de València, Hrvatski savjet za zelenu gradnju, Hrvatska Gospodarska Komora and Regionalna energetska agencija Sjever). For the private companies, those involved in the procurements conducted by Koprivnica and València were computed.





In that sense, because of the great dissemination and networking activities, these indicators were accomplished along the project. This implies that by applying the After-LIFE the targets forecasted would be covered.

11.1 Website (mandatory)	no. of individuals		
	Begin	End	Beyond 5 years
	Value	Value	Value
Proposal	0	1,000	5,000
Real	0	5,718	6,000

As detailed in the website analytics, users visiting the website were more than 5,000. Forecast is then updated as the initial targets is achieved at the end of the project.

Other indicators related to 11.2. Other tools for reaching/raising awareness of the general public were fully covered and explained as the dissemination activities shown in previous sections.

12.1 / 12.2 Networking (mandatory) and other professional training or education short capacity building seminar	No. of individuals trained			4
	Begin	End	Beyond 5 years	
	Value	Value	Value	
Proposal	0	80	80	
Real	0	35+31	80	

Even when records for the four capacity building seminars showed less than 80 people attending the training sessions, the GUF Tool was deeply showed to other organisations not present in those dates. Beneficiaries conducted face-to-face meetings with actors interested in the GUF Tool. No evidences are directly recorded, but the number of users registered to the GUF Tool showed these numbers were covered.

14.4.1 Entry into new entities/projects	New entity		No.
	Begin	End	
	Value	Value	Value
Proposal	0	1,000	3,940
Real	0	2,841	3,940

14.4.3 Entry into new entities/projects	New entity		No. (NUT 3)
	Begin	End	
	Value	Value	Value
Proposal	0	75	75
Real	0	75	75

2706 municipalities in Spain belong to the Network of Sustainable Local Development. 35 municipalities in Croatia belong to the Croatian Rural Development network. 100 members associated in ACR+, mainly local and regional authorities representing around 1,100 municipalities throughout Europe.