



URBAN GreenUP

**D7.11: Exploitation and market deployment plan
(Interim)**

WP 7 , T 7.3

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0 Executive summary

The document aims to provide an updated version of the project exploitation strategy and plan that will be implemented for the exploitation and market deployment of URBAN GreenUP results. The strategy to exploit the project results, with particular attention on NBS implemented in front-runner cities, is crucial to create a NBS market open to European and non-European actors.

All data concerning the exploitability of results will be collected and will be organized to set the basis to assess the potential deployment of each NBS intervention implemented in URBAN GreenUP front-runner cities. The deliverable will also set the methodology for the assessment of the exploitation potential of NBS from the private and public perspective. Finally, the survey for the analysis of the social and economic benefits generated by NBS in front-runner cities will be defined.

The deliverable is structured as follows:

- Section 1: introduction of the topic and explanation of the connection with other WPs and partners' activities;
- Section 2: exploitation and market deployment strategy objectives and structure;
- Section 3: classification of the project exploitable results;
- Section 4: definition of the methodology for the assessment of exploitation potential for public and private stakeholders;
- Section 5: definition of the survey for the assessment of the economic and social benefits of NBS in front-runner cities;
- Section 6: conclusions and next steps.

It must be highlighted that the exploitation strategy of URBAN GreenUP project is a living document that will be updated and enriched during the whole duration of the project to ensure a correct assessment and exploitation of all results.



1 Introduction

The deliverable aims to provide an updated version of the exploitation strategy for the URBAN GreenUP project. It is based on the structure of the D7.1 Exploitation and market deployment plan submitted in M4.

URBAN GreenUP is a Research and Innovation Action, which will develop a tailored methodology to support the co-development of Renaturing Urban Plans focused on climate change mitigation and adaptation, efficient water management and to assist in the implementation of NBS efficiently through a fully replicable demonstration action of NBS. Therefore, the project implementation will deliver a variety of results, ranging from knowledge to specific products, services, methodologies, as well as the implementation of a set of NBS.

URBAN GreenUP will act both individually and collectively through systematic, project-duration exploitation activities. For citizens, the project will provide a space of interaction between citizens, the private sector and the government that will result in a more inclusive society, which uses co-design and co-development to improve the innovation capacity and to create an advanced model of community. For installers and SME contractors, URBAN GreenUP will provide new, innovative business models for NBS. For technology providers, the project will create demand for these new products and services. For the cities, URBAN GreenUP will provide an invaluable strategy for Urban Renaturing in line with the demanding objectives of GHG emission reductions, improve comfort and well-being of its inhabitants and enhance the attractiveness and competitiveness of the cities. Indeed, the exploitation potential of these results will be evaluated both from the public sector point of view (with the involvement and collaboration of demo site cities) and from the private sector point of view (with the involvement of industrial partners of the project) to define exploitation models to fit public and private sector interests and needs. All data concerning the exploitability of results will be collected and will be organized to assess the potential deployment of each NBS intervention implemented in front-runner cities. Business models and associated financing mechanisms will also be assessed concerning their transferability linking task 7.3 with the work that has been carried out in task 7.2.

1.1 Contributions from other partners and connection with other WPs

The exploitation strategy is a cross-cutting issue for the URBAN GreenUP project since it aims to exploit all the results generated during the duration of the project. All the project WPs are connected with WP7 and in particular with task 7.3 related to the exploitation activities to be carried out for the deployment of all URBAN GreenUP results including not just the NBS that will be implemented in front-runner cities but also the other project results.

Partner	Contribution
UBO	Definition of the deliverable. Work Package Leaders.
All partners	Assessment of own ERs; Internal discussions to define initial strategy Coordination with UB and other partners for joint results

Table 1: Project partners' contribution



2 Exploitation and market deployment strategy

2.1 Objectives and approach

URBAN GreenUP exploitation strategy focuses on exploiting and spreading the project results to be used in several contexts and situations by relevant stakeholders, who will take advantage of these services, products, and methodologies, replicating and exploiting them at local, regional, national or international levels beyond the project lifetime.

URBAN GreenUP main objectives are:

- Define a strategic framework allowing to duly collect and organize project results and assess their exploitation and deployment potential;
- Delineate and implement a set of activities to correctly exploit the project results;
- Guarantee an appropriate articulation with dissemination activities, ensuring that the project developments are regularly communicated to target audiences, towards a growing impact and an increasing market uptake;
- Ensure that the project outcomes last beyond the project lifetime;
- Define appropriate exploitation models, adapted to the selected target groups, ensuring that their interests and needs are met;
- Ensure accessibility and open access to all URBAN GreenUP project results and associated outcomes.

URBAN GreenUP dissemination and exploitation activities are interrelated and they will take place throughout the project lifespan. Even though separate plans for Dissemination (D8.2) and another one for Exploitation (D7.1) are to be developed, it is understood that an effective exploitation strategy should comprise both dissemination and exploitation activities.

In this regard, this document aims at updating and expanding the exploitation strategy defined through D7.1 ensuring effective exploitation of the project results through and after its implementation process. This strategy, comprising tools and activities, will allow the project target audiences to benefit from the project knowledge, thus promoting further research and allowing an increasing market uptake of these solutions.

2.2 Structure

The structure comprises an accurate and sharp methodological framework that allows understanding the logical connection between the strategic and operational components of the Exploitation and Market Deployment Plan.

D 7.11 aims i) to improve and adjust the list of the target audience that has been proposed in D 7.1; ii) to update the list of the exploitable results, iii) to define the next steps for the analysis of the exploitation potential for the private and public sector and finally iv) to define a methodology for the assessment of the potential economic and social benefits.

Figure 1 visually summarizes URBAN GreenUP exploitation thematic and methodological framework developed in Deliverable 7.1.



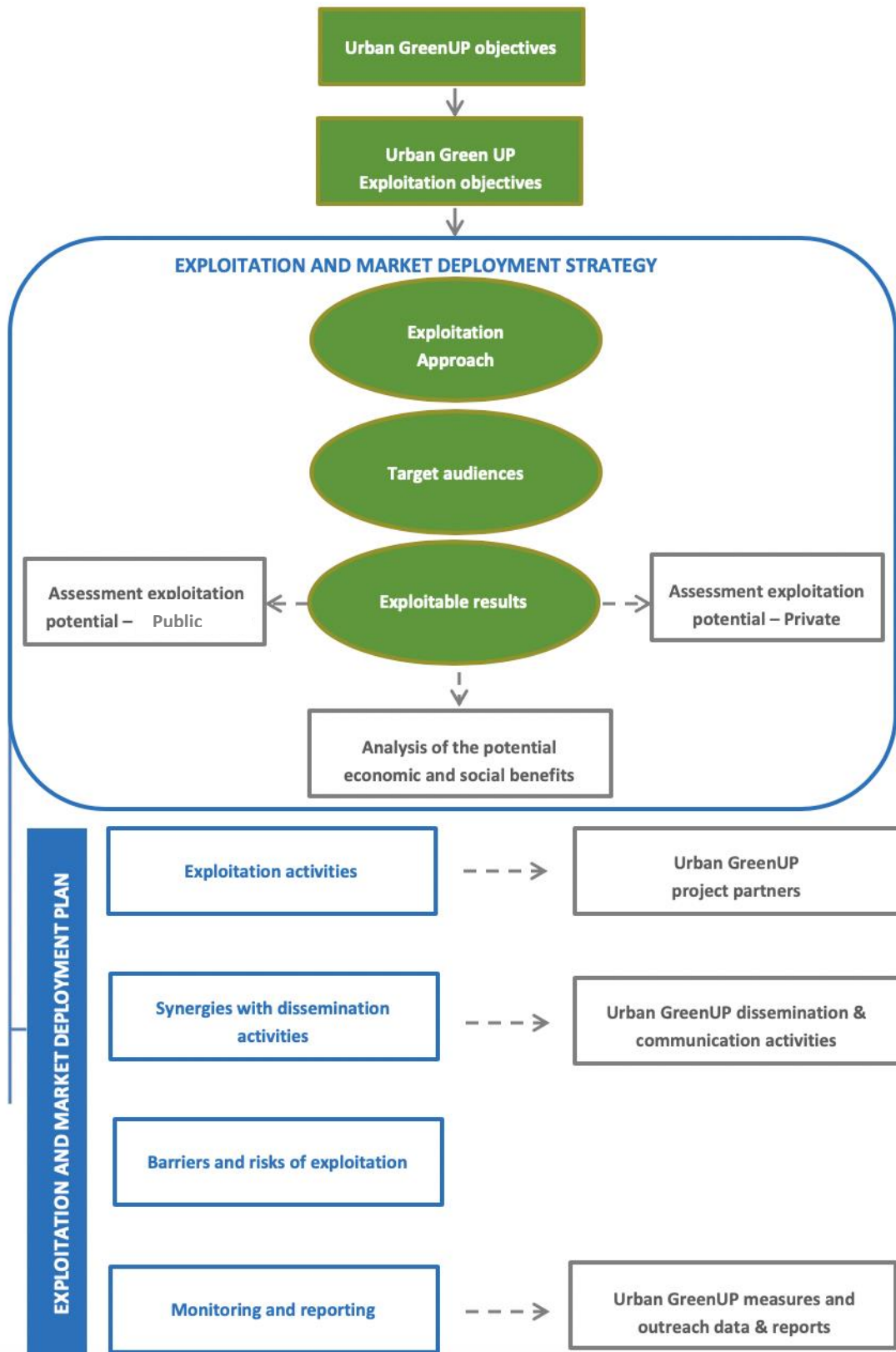


Figure 1: URBAN GreenUP thematic and methodological framework

2.3 Target audience

The target audiences are basically constituted by entities and/or individuals that can benefit from project results. Aiming at ensuring the sustainability of the project through an effective and targeted exploitation of the products, services, methodologies and overall knowledge produced, URBAN GreenUP has individuated and classified the target audiences listed in Table 2.

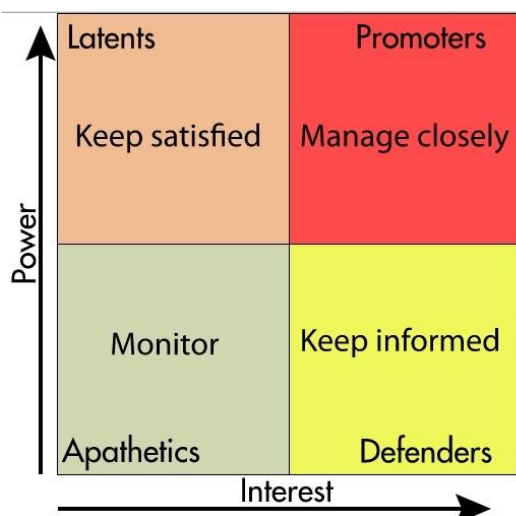
The target audience has have been grouped into five different categories of stakeholders, namely:

- i) **public agencies/government** (municipalities, city council and city administration, national and regional governments, and environmental protection agencies);
- ii) **businesses/companies** (city services companies, utility providers, urban planners, architects, nurseries and green infrastructure companies, industry and SMEs, trade unions and professional associations, and NGOs)
- iii) **academia/R&D** (academic organizations, institutional research organizations, students and trainees, and industrial research organizations);
- iv) **society** (citizens and local communities);
- v) **international bodies** (standardization bodies, EC, European institutions and agencies, and international, regional and multilateral organizations).

This classification takes an extra step from the classical private versus public one, since it doesn't stop at the dichotomy but is able to further classify the target audience. A finer classification allows for a better understanding of the approach to take to every single group in order to maximize the benefits of the exploitation strategy.

These groups can also be classified along other dimensions, such as the level of interest and power they have in exploiting the project results, their focus on research of new NBS instead of implementing them, or their scale – national versus international stakeholders.

Eventually, the target audience has been also analyzed according to the mapping proposed by Mendelow (1991), which examines the influence of each stakeholder. A 2x2 grid is created,



where “power” – the stakeholder’s ability to influence objectives - is on the vertical axis and “interest” – the stakeholder’s willingness to participate - is on the horizontal one. The grid is divided into four areas, where movements from top to bottom entail lower power, whereas those from left to right higher interest. It is important to note that, once a stakeholder has been placed into one of the four categories, it can still move to another if its power or interest level changes. That is, the mapping of stakeholders is not static. Figure 2 illustrates Mendelow’s matrix.

Figure 2: Mendelow’s matrix.

According to this matrix, stakeholders can be divided into four groups, namely: i) latents, ii) promoters, iii) apathetics, and iv) defenders.

- i) Latents (high power, low interest) don't have a particular interest in participating in the project but are able to influence it greatly if they were to change their mind. Since their contribution can be very relevant and facilitate the achievement of the exploitation strategy, they must be followed constantly and offered incentives in order to win them over and turn them into promoters. Examples of groups belonging to this category are utility providers, urban planners, and financial institutions.
- ii) Promoters (high power, high interest) are highly interested in the project and also have the power to make it successful. Since they are the most important actors, they must be managed closely. Their involvement is essential to the outcome of the project; hence it is paramount to pay attention to their opinions and to have them as part of the team. Examples include municipalities, city council and city administration, national and regional governments, and the EU institutions.
- iii) Apathetics (low power, low interest) are not interested in the project and cannot contribute significantly to it either. They do not need particular attention and keeping them informed sporadically should suffice. Examples include trade unions, students and trainees, and the industry and SMEs.
- iv) Defenders (low power, high interest) are not of great help when it comes to achieving the project's objectives, but they have taken an interest in it. A more constant flow of information towards this last category might prove to be successful in having additional support at disposal if needs be. Examples include local communities, NGOs, nurseries and green infrastructure companies.

During the identification of the target audience, the market needs of each target group have been individuated as well. The market needs inform organizations about what products to develop, for what customers, at what cost, through which distribution channels, thus reducing the uncertainty that a new product/service development always brings with it. Among the identified market needs there are standards for NBS adoption at the urban level, process standardization, product identification, knowledge networks, land use regulation, the achievement of higher energy standards, and several types of NBSs that the group might be more apt to focus on.

However, this is not comprehensive, and in order to obtain a more exhaustive list of the market needs of each stakeholder, focus groups will be held with the partners of URBAN GreenUP in the near future during the project meetings.



Stakeholder group	Target group	Profile	Market needs	R&D vs Implementation (I)	Public vs private	International vs national	High or Low interest	High or Low power	Mendelow's matrix
PUBLIC GOVERNMENTS	Municipalities, City Council and city administration	Cities and metropolitan authorities	Urban resilience improvement Social impacts of the NBS Knowledge of the standard costs of the NBS	I	Public	N	High	High	Promoters
	National and regional governments	National and local governments and public authorities; Planning/Urban Planning Ministries, Environment and Agriculture Ministries, European committees, Community Leaders, Environment and Planning Authorities and institutions, Legislators	Social impacts of the NBS, Knowledge of the standard costs of the NBS Process standardization to implement NBS homogeneously	I	Public	N	High	High	Promoters
	Environmental protection agencies	Agencies aimed to protect and safeguard natural resource at national and international level	Biodiversity protection Knowledge of the standard costs of the NBS Process standardization to implement NBS	I	Public	N	Low	High	Latents
	Standardization bodies	These organizations are critical to ensure a common terminology and minimum characteristics of a SSC, as well as to define measurement methods to assess the performance and sustainability of NBS	Urban resilience improvement Social impacts of the NBS Information on current NBS available	R&D	Public	I/N	High	High	Promoters
BUSINESSES	City services companies	They implement SSC solutions to increase city services efficiency	Urban resilience improvement Opportunities to improve city attractiveness	I	Public	N	Low	Low	Apathetics



			Information on land use regulation						
	Utility providers	They are responsible for the deployment of some of the features of NBSs like water management	Achievement of higher energy standards Product certification Knowledge of the standard costs of the NBS	I	Public/Private	N	Low	High	Latents
	Nurseries and green infrastructure companies	These companies might be interested in providing the vegetation that makes up or the structures needed to set up the NBS	Identify market opportunities and customer base Knowledge of the standard costs of the NBS	I	Private	N	High	Low	Defenders
	Industry and SMEs	Industries and SMEs with different core businesses	Knowledge of the standard costs of the NBS Opportunities to improve brand image	I	Private	N	Low	Low	Apathetics
	Urban Planners	Experts working in management, administrative and technical positions somehow associated with critical areas of the project, such as urban/landscape planning, environment, infrastructure, etc.	Spread of NBS adoption Interest of the city to implement NBS Standardization of NBS	I	Public/Private	N	Low	High	Latents
	Architects	Architects interested in including green solutions in buildings design	Customers interested in financing the NBS Standards for NBS adoption at the urban level Opportunities to improve neighborhood attractiveness	I	Private	N	Low	Low	Apathetics



SOCIETY	Citizens	Citizens and general public (all types of audiences, with different ages, backgrounds and education levels)	Urban resilience improvement Opportunities to improve neighborhood attractiveness Increase in green areas in city	I	N.A.	N	Low	Low	Apathetics
	Trade unions and professional associations	Associations interested in improving the working place and conditions through the adoption of green solutions	Contribution to working environment Knowledge of the standard costs of the NBS Process standardization	I	Private	N	Low	Low	Apathetics
	NGOs	Non-governmental with an interest in the project regardless of their amount of technical knowledge on the subject, such as environmental associations	Urban resilience improvement Opportunities to improve the overall city Valuation of the social impacts of the NBS Natural area protection	I	Public/private	I/N	High	Low	Defenders
Local communities	Local communities interested in improving the quality of green spaces in cities	Urban resilience improvement Opportunities to improve neighborhood attractiveness Increase in green areas in city	I	N.A.	N	High	Low	Defenders	
ACADEMIA/R&D	Academic organizations	Universities, research & innovation centers, technology providers, consultancies	Information on current NBS available Opportunities to expand existing literature on the topic Availability of funding	R&D	Public/Private	N	Low	Low	Apathetics
	Institutional Research Organizations	Educational institutions	Information on current NBS available Opportunities to expand existing literature on the topic Availability of funding	R&D	Public	N	Low	Low	Apathetics



	Industrial Research Organizations	Organizations aimed at the acquisition of new knowledge and skills for developing new products, processes or services or for bringing about a significant improvement in existing products, processes or services	Information on current NBS available Standardization of NBS Availability of funding	R&D	Private	N	Low	Low	Apathetics
INTERNATIONAL BODIES	EC	National and regional governments	Process standardization Valuation of the social impacts of the NBS Interest of governments in the implementation of the NBS	I	Public	I	High	High	Promoters
	European institutions and agencies	European institutions interested in the SCC results in order to enrich the policy and data available on NBS	Urban resilience improvement Social impacts of the NBS Information on current NBS available	R&D	Public	I	High	High	Promoters
	International, Regional and Multilateral Organization	They include UN agencies and multilateral organizations. They can be promoters of initiatives towards human development, environmental sustainability and improvement of quality of life worldwide	Urban resilience improvement Social impacts of the NBS Standard for NBS adoption at the urban level.	I	Public	I	High	High	Promoters
FINANCIAL INSTITUTIONS	Insurance companies	Financing organizations with interest in investing in the development of NBS	Knowledge of the investment risk level Return on investment Players interested in financing the investment	R&D	Public/private	N	Low	High	Latents



	Multilateral development banks	Financing organizations with interest in investing in the development of NBS	Knowledge of the investment risk level Return on investment Players interested in financing the investment	R&D	Public	I	Low	High	Latents
	Banks, foundations, capital management bodies, and large private investors	Financing organizations with interest in investing in the development of NBS	Knowledge of the investment risk level Return on investment Players interested in financing the investment	R&D	Public/private	I/N	Low	High	Latents
OTHER	Eu projects	Project partners interested in capitalizing on the project results	Valuation of the social impacts of the NBS Knowledge of the standard costs of the NBS Standards for NBS adoption at the urban level	I	Public	I	High	High	Promoters

Table 2: URBAN GreenUP target audience



3 Exploitable results and partner activities

According to the EC, exploitation is the *“utilization of results in further research activities other than those covered by the action concerned, or in developing, creating and marketing a product or process, or in creating and providing a service, or in standardization activities.”*

Exploitation aims at highlighting the value created by the project’s activities and explore how to make use of and amplify it once the project is over. The project is expected to produce a significant number of results, which can be further leveraged after the project’s end to the benefit of services and research organizations, technology companies, NGOs, local authorities, and citizens.

All data concerning the exploitability of results will be collected and will be organized to assess the potential deployment of each NBS intervention implemented in demo site cities. Based on this a template to collect all the project results of URBAN GreenUP has been defined. The template is composed of 5 sections:

1. **Exploitable results**
2. **Partners and IPR**
3. **TRL, Marketability & Replicability**
4. **Exploitation activities**
5. **Barriers and risks**

Project partners have been called to fill the template with all the results that will be produced during the project duration. The template will be used to create the final database and to collect the exploitation strategies of the partners which may be different even if the result obtained is the result of the joint work of two or more partners. Furthermore, this information will help to understand what the potential of exploitation is for public and private partners that will then be explored through deliverables: D7.5: Table of exploitable results, business models, and financial instruments to implement NBS for the private sector; D7. 6: Table of exploitable results and related business models and financial instruments to be used to implement NBS for the public sector; D7.7: Report on the exploitation strategy for public and private bodies.

The following paragraphs cover each section of the template providing a detailed description of the topics and a summary of the outcomes obtained through the contribution of all partners. Instead the full list of the exploitable results is reported in Annex I. The template includes all exploitable results that means that NBS and other exploitable results are included.

3.1 Exploitation results

The section “Exploitable results” aims to identify the key exploitable results and provide a brief description for each of them. The section includes the following categories:

- **Filled by:** the item provides the partners' short name that filled in the result.
- **Result number:** the item provides the progressing number of results.
- **Result name and result description:** the item provides the name and a short description of each result.



- **Individual/Joint result:** the item lists the partners' involvement and specifies if the result belongs only to one partner (individual) or is shared with more than one partner (joint). In general, when the IP foreground is just with one partner, the result is individual, even if the generation of the result might have involved other partners. A result was considered joint by partners in different cases:
 - When the IP foreground was shared among different partners;
 - When the IP foreground of the specific result is not shared, but the involvement of other partners is needed for its fulfillment (a collaboration or partnership is needed).
- **Type of result:** the item describes if the result is a tangible (product or service), or intangible (advancement in knowledge, methodology, model, or process).
- **Other type of result:** in the case that a result will fall in more than one type of categories lists it in the "other types of result" column.
- **Marketability:** the item highlights if the result and in particular its exploitation pathway has a commercial or non-commercial nature, so if it will be brought to the market for commercialization and direct profit purposes (such as products or some types of services) or instead for no profit purposes (such as policymaking, research activities and services provided by local authorities to citizens). Public services are by definition non-commercial. A result can also be both commercial and non-commercial if different exploitation pathways are planned.

3.2 Partners and IPR

The second section "*Partners and IPR*" focuses on partners' involvement and Intellectual Property Rights (IPR). IP matters are fundamental to clearly define the ownership of a result and how owners want to exploit it in the market in terms of protection (IPR). The section clearly distinguishes between IP ownership and IPR, which refers to acquired rights (measures to protect IP), as IP ownership on its own doesn't guarantee IPR.

The following categories are included:

- **Partners' involved:** the item provides a comprehensive list of all partners involved in the result, including project's partners and third parties' contributors.
- **Type of access of the result:** the item describes if partners involved chose to open the result to the public or to keep it private. A result can be fully or partially open to the public and that open results can in some cases be protected by some IP measures (for example copyright in scientific publications).
- **Intellectual Property ownership of both background and foreground:** the item aims to list all the partners which have background and foreground ownership on the result, specifically:
 - All the partners holding background information used for the deployment of the result, covering "*Any data, know-how and/or information, whatever its form or*



nature (tangible or intangible) - including any rights such as intellectual property rights - which are needed to carry out the project or exploit its results.” (EU, 2019)

- All the partners holding foreground information: *“Any tangible or intangible output of the action (such as data, knowledge and information, whatever their form or nature, whether or not they can be protected), which are generated in the action, as well as any attached rights, including intellectual property rights. It includes intellectual property rights (e.g. copyrights, industrial designs, patents, plant variety rights), similar forms of protection (e.g. rights for databases) and unprotected know-how (e.g. confidential material)”.* (EU, 2019)
- **Expected measures to protect IP – IPR:** the item aims to describe the preliminary measures planned to protect the IP of each result (if any). They include:
 1. Industrial property right such as trademarks, patents, industrial design, and utility models.
 - Trademarks are signs used in trade to identify either products or services.
 - Patents are titles providing with the exclusive right to prevent others from possessing, using, selling, manufacturing & importing the invention. Patents are recommended for protecting functional/technical aspects, products/processes, novelty/inventive steps.
 - Utility models are the title of protection for certain inventions, such as in the mechanical field, which does not meet the patentability criteria, recommended for protecting technically fewer complex inventions and inventions with a short commercial life.
 - Industrial designs are rights to protect the original, ornamental, and non-functional features of a product that result from design activity. Industrial designs are recommended for protecting the appearance (the 'design') of a product, not the product itself and to exclude others from making, importing, selling, articles in which the design is embodied.
 2. Soft IP: measures to protect intellectual assets that are not included in industrial property or falling into copyright but have an important value for organizations. Soft measures are not registered and recommended for protecting know-how, trade secrets, and confidential information.
 3. Copyright whose purpose is to protect the legal interests of certain persons and legal entities who contribute to making works available to the public. Copyright is recommended for protecting the expression of ideas, not products, and for work distributed to the public (i.e. publications, software).

3.3 TRL Marketability and replicability

The third section focuses on the “TRL, Marketability & Replicability” exploitation category and describes TRL (Technology Readiness Level), Marketability and Replicability, as measures to assess readiness and potential uptake of the result after project’s end.



The following categories are included:

- **TRL at month 0 and 60:** provide the improvement of a project result using the technology readiness that measures the maturity of a technology embedded in a result using a scale from 1 to 9. The scale is the one introduced within Horizon 2020 framework and it is as follows:
 - N.A. – not applicable;
 - TRL 1 – basic principles observed;
 - TRL 2 – technology concept formulated;
 - TRL 3 – experimental proof of concept;
 - TRL 4 – technology validated in lab;
 - TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies);
 - TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies);
 - TRL 7 – system prototype demonstration in operational environment;
 - TRL 8 – system complete and qualified;
 - TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space).

TRL applies only to technology-oriented results.

- **Market readiness at month 60:** market readiness is measured as an assessment of the expected readiness of the result at the end of the project, considering that technology readiness (described by TRLs above). Market readiness is expressed in qualitative terms, as:
 - High;
 - Medium;
 - Low.
- **Market readiness comment:** this optional subcategory was added for partners that wanted to comment on the market readiness.
- **Year of commercialization or availability:** indicate the planned year in which commercialization is expected to start or the result can be available. Results with a commercial marketability provide the year of commercialization and results with non-commercial marketability refer to the year of availability. This measure is expressed using as benchmark the end of the project: the availability or commercialization year is chosen from the following options:
 - N.A. – not applicable;
 - End of the project;
 - 1 year after the end of the project;
 - 2 years after the end of the project;
 - 3 years after the end of the project;
 - 4 years after the end of the project;
 - 5 years after the end of the project.



- **Potential replicability or upscaling** indicates if a result can be exported and replicated in other areas outside the project scope or scaled up. The category provides only a Yes/No assessment.
- **Replicability/upscaling comment:** this optional subcategory was added for partners that wanted to comment on the upscaling/replicability potential.

3.4 Exploitation activities

The section provides an assessment of partners' strategy and exploitation pathways for each result. The following categories are included:

- **Planned use:** the item provides an overview of the exploitation strategy over the result. The category explains how partners are exploiting or want to exploit the result after the project's end for their scientific, political, research, or economic/commercial purposes. All exploitation possibilities are considered, including for example commercialization of products, the launch of services, replicability and upscaling in other areas, but also use in university courses, leverage for further R&D, increased visibility thanks to new scientific publications, etc.
- **Target audience:** the item provides a list of the key target audience, covering all stakeholders the result intends to target in the future.
- **Management:** the item defines how the result could be brought to market, how a partner intends to manage and organize the activities in carrying out the result. Examples may include own management (activities carried out by an existing unit within the existing organization), collaborations, partnerships and/or other agreements with partners and/or other stakeholders, the set-up of a new unit within their organization, etc.
- **Channels:** the item indicates which channels are used/will be used to bring the result to the market and/or reach their target segments after the project's end. This can include sales channels for commercial results and any other sorts of channels expected to be used for the go-to-market. It can cover already existing channels or new ones, and both online and offline channels.
- **Partnerships:** the item indicates which partners (within and outside the consortium) are needed to exploit the result. Other than partners within the consortium needed to carry out the result, partnerships, and collaboration with external stakeholders are considered.
- **Value proposition:** the item provides a short analysis in qualitative terms of the value brought by the result to the different target audience (e.g. benefits, problems solved, needs satisfying).

3.5 Barriers and risks

The section provides an assessment of the possible barriers to the exploitation of the results. The following categories are included:



- **Barriers and Risks:** indicate the possible barriers and risks that could hamper adoption, and/or replicability including internal and external risks.

3.6 Main results

All details regarding the URBAN GreenUP exploitable results are presented in the database reported in Annex I. The results will be continuously monitored, revised and updated to design the final exploitation plan (D 7.7 M60). The exploitation plan will provide a deep analysis of the results and their strategy, will compare them, identify common issues and highlight strategic differences, suggest possible partners' collaboration and define a model and roadmap for an effective go-to-market.

The partners provided 72 key exploitation results, which are divided by 8 types of results: *NBS*, *product*, *service*, *methodology*, *model*, *process*, *advancement in knowledge*, and *other*. The "other" usually includes results which belong to more than one of the aforementioned categories. There are 27 exploitation results which are related to the *NBS* category, 10 to product, 5 to service, 6 to methodology, 3 to model, 1 to process, 11 to advancement in knowledge, and 9 in other. Results are almost evenly split between individual and joint ones – 32 and 39 respectively. For the *NBS*, *product* and *service* categories, joint results are twice or more than twice as much as individual ones, whereas the opposite holds true for the *methodology*, *model* and *process* categories; within *advancement in knowledge* and *other*, individual and joint results are almost the same.

When it comes to marketability, almost half of the results' exploitation pathways are non-commercial (34 out of 72). 17 results have a commercial nature, whereas the remaining 21 have a dual nature (both commercial and non-commercial). More in detail, 9 results related to *NBS* are commercial, 11 non-commercial and 7 both. For *product*, 5 are non-commercial, 4 commercial and 1 both; for *service*, 1 is non-commercial, 2 commercial and 2 both; for *methodology*, 5 are non-commercial, and 1 both; for *model*, 2 are non-commercial, and 1 both; for *advancement in knowledge*, 10 are non-commercial, and 1 both; finally, for other, 1 is non-commercial, and 8 both.

The partners have mainly chosen to make their results public instead of keeping them private – 44 and 15, respectively: indeed, 20 results belonging to the *NBS* category are public, whereas only 5 are private; for *product*, 5 are public and 3 are private; for *methodology*, 3 are public and 1 is private; for *model*, 3 are public; for *process*, 1 is public; for *advancement in knowledge*, 6 are public, and 1 is private; and for *other*, 5 are public, and 2 are private. Only results of the *service* category are preferred to be kept private over being made public – 3 and 1, respectively. Among the preliminary measures planned to protect the IP of each result, soft IP is the most preferred one, with a total of 21 instances. Copyright follows with 5 results, trademarks and patents with 4 each, and utility models with 2. Finally, only one result plans on relying on each of the industrial design, confidential information, and company know-how measures.

There is a different progress of technology readiness level (TRL) within the different types of result: for *NBS* and *product*, on average, the TRL will have increased by more than 3 categories by the end of the project; for *advancement in knowledge* by 2 categories; for *service* by less than one category; and for *other* by 5 categories.



Considering the technology readiness level at month 60, expected readiness of the results is mainly high for most results (30 out of 39): for *NBS, service, methodology and advancement in knowledge*, the expected readiness of results is medium/high, whereas for the remaining categories – *product, model, process, and other* – it is high.

For most categories (*service, methodology, model, process, and other*), commercialization will start at the end of the project; for *NBS and product*, on average, it will start three months after the end of the project, whereas for *advancement in knowledge*, it will begin 1 year after the end of the project. For 51 out of 52 instances, there is potential to replicate and/or upscale the result.

Results can be exploited by several stakeholders ranging from governments, business, citizens etc., and each category of results targets a different target audience. Figure 3 shows the distribution of stakeholders within the 8 types of results.

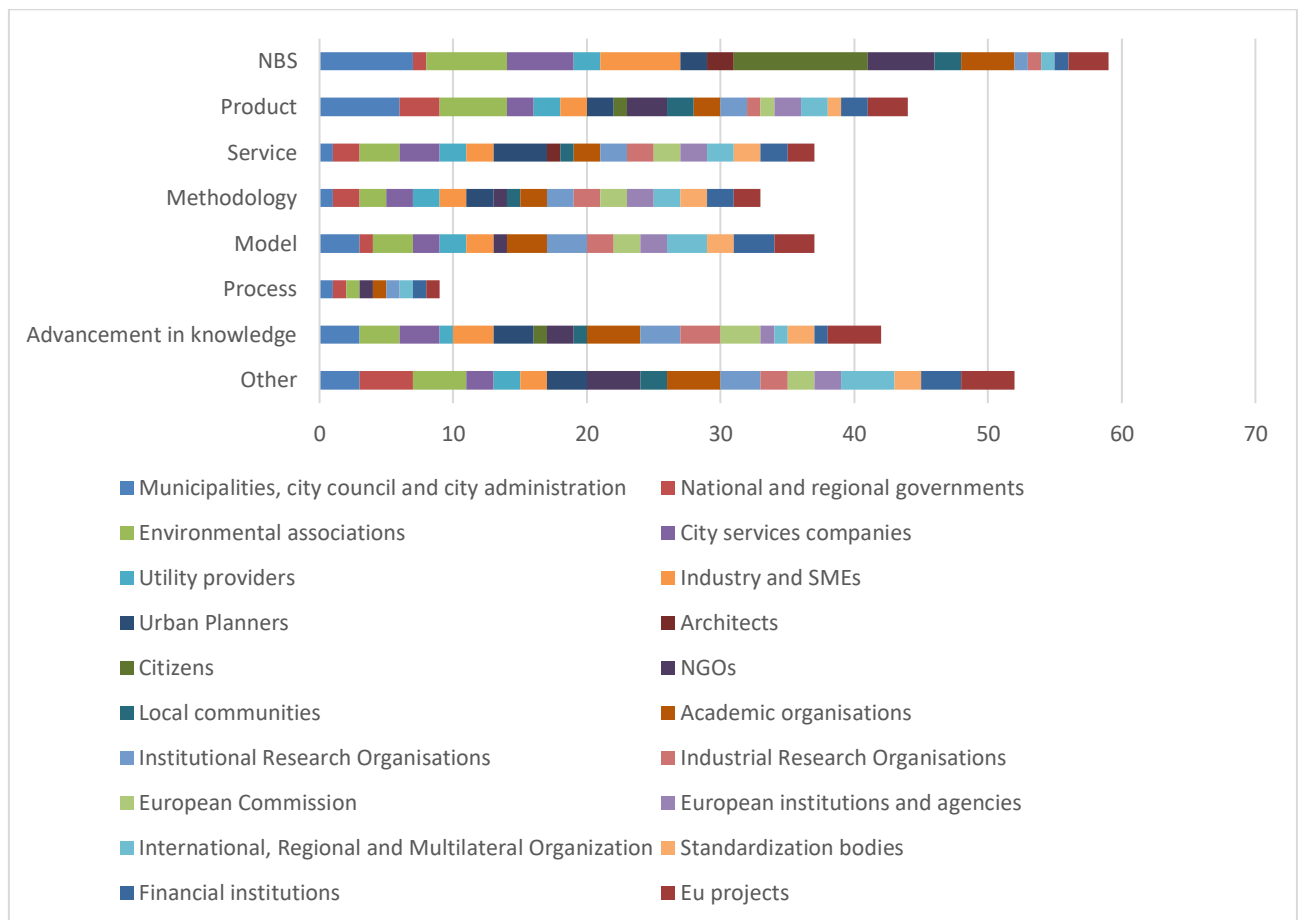


Figure 3: Target audience by type of results

There are several partnership options to be adopted in order to exploit the results. All categories but *model* and *process* will make use of activities carried out by an existing unit within existing organizations. One result within the *methodology* category, 2 within the *advancement in knowledge* one and 1 within the *other* category will exploit their results through IFO. However, the preferred options are partnerships (11 results in total, 5 of which belonging to NBS), and own management (16 results in total, 11 of which belonging to NBS).

Barriers to the exploitation of results have been signaled by the partners concerning most of the results: 51 out of 72 results are expected to have barriers that hamper their adoption or



replicability. The barriers are very heterogeneous and are not the same based on the type of result. However, among the most recurring, there are budgetary and legal issues, maintenance, lack of interest, and data availability.

The full list of the exploitable results is available in Annex I. The list will be updated during the development of the project since the results can slightly change. Furthermore, the list will be used for the assessment of the exploitation potential of URBAN GreenUP results for the public and private sector.



4 Assessment of exploitation potential

As illustrated in chapter 2 different typologies of stakeholders can be interested in the results produced through URBAN GreenUP project. These stakeholders can be grouped in two categories: public and private (see chapter 2), the public sector includes governments and all publicly controlled or publicly funded agencies, enterprises, and other entities that deliver public programs, goods, or services, and local governments or subjects are of particular interest for the project. These entities are responsible for urban and local planning activities in key domains, which can largely be supported by URBAN GreenUP tools and methodologies. Furthermore, the knowledge generated by the project can represent the ground base for their further planning activities and investment decisions. On the private sector side, private partners (large enterprises, SMEs, etc.) can bring the innovation deriving from the project into commercial strategies. For these reasons, the assessment of the exploitation potential of project results (NBS and other project results) will be conducted from two different perspectives, the public and the private sector taking into account the different market needs preliminary identified in chapter 2.

Particular attention will be dedicated to the NBS implemented in front-runner cities. In fact, the assessment of the exploitation potential for the different stakeholders – private and public – will be propaedeutic for the definition of the several deliverables related to WP7:

- D7.5: Table of exploitable results, business models and financial instrument to implement NBS for the private sector - M60;
- D7. 6: Table of exploitable results and related business models and financial instrument to be used to implement NBS for the public sector - M60;
- D7.7: Report on the exploitation strategy for public and private bodies M60.

To assess the exploitation potential of the different results produced by the URBAN GreenUP project it will be necessary to involve internal stakeholders – URBAN GreenUP project partners - and external stakeholders through the creation of ad hoc workshops. In this way, it will be possible to assess the exploitation potential taking into account all target audiences individuated and listed in Table 2.

The workshops that will be organized (2, one for the public stakeholders and one for the private stakeholders, involving at least 30 individuals per each workshop) have different objectives:

- Identify the market needs of the target audience listed in Table 2;
- Analyze the markets opportunities;
- Identify the most suitable exploitation strategy per typo result (NBS, product, service, etc.);
- Analyze the available business model and financial instruments identified through D7.2 “Guidelines for the definition of innovative business models for NBS”;
- Identify the synergies between each NBS implemented through the URBAN GreenUP project and the business models identified in D7.2 “Guidelines for the definition of innovative business models for NBS”.

The workshops will be held online to facilitate the participation of external stakeholders ensuring the presence of EU and extra EU countries. Furthermore, URBAN GreenUP partners will



support Bocconi University in involving external stakeholders (local, national, and international).
The workshops will be structured in 3 main thematic areas:



Figure 4: workshops structure

The activities during the workshops will be carried out using innovative approaches to facilitate the exchange of the knowledge and the dialogue between the participants (instant surveys, polls, gamification, etc.).

5 Analysis of the potential economic and social benefits

Task 7.3 aims also at assessing the economic and social benefits, linked to the implementation of NBS in front-runner cities.

NBS implementation generates revenues that impact on the socio-economic context. To evaluate these benefits, an ex-post analysis of the NBS impacts generate on the socio-economic context of front-runner cities will be carried out to highlight which are the side effect produced in the three different cities: Valladolid, Izmir and Liverpool (side effects improve the perception of the city and human well-being, can improve the livability in cities, human health, improve security, attract more tourism, attract new business). The results will be resumed in a table in which each NBS will be related to the possible effects generated from their implementation.

The assessment will be carried out through a survey that will be distributed to the officials of the municipality of the front-runner cities and the citizens. To engage these two typologies of stakeholders two surveys have been defined. The survey for the municipalities aims at assessing the impact generated by the NBS. Through an extensive literature review the benefits generated by the NBS at urban level has been individuated. The table below, Table 3, represents the different impacts that have been individuated.

Benefit	Example	References
Aesthetic improvement	Enhanced beauty	(Ribeiro and Ribeiro, 2016) (Rall et al., 2017)
	Improved aesthetic quality of the landscape	
Spiritual connection	Provide sense of calm	(Fish et al., 2016) (Ordóñez Barona, 2015) (Vollmer et al., 2015) (Dou et al., 2017) (Mesimäki et al., 2017)
	Benefits on affect and cognition	
	Pleasure of experiencing nature	
	Inspiration for art or culture	
	Support exploration of religious feelings	
Preservation of cultural heritage	Impact on cultural-historical values	(Karrasch, Klenke and Woltjer, 2014) (Dieleman, 2015) (Ribeiro and Ribeiro, 2016)
	Safeguarding or restoring cultural heritage	
Recreation opportunities	Provide opportunities for relaxation	(Kabisch and Haase, 2014) (Liquete et al., 2015) (Dou et al., 2017) (Rall et al., 2017)
	Enjoying nature	
	Encourages physical exercise;	
	Opportunity for outdoor activities	
Well-being enhancement	Improve physical and mental health	(Bell et al., 2008) (Demuzere et al., 2014) (Heckert and Rosan, 2016)
	Increase physical activity	
	Relieves stress	
Opportunities for social interaction	Encourage child's play;	(Kabisch and Haase, 2014) (Karrasch, Klenke and Woltjer, 2014) (Dieleman,
	Improved sense of community	
	Meeting place for residents	

	Participation and integration in decision-making processes, transparency	2015) (Shackleton <i>et al.</i> , 2015) (Vollmer <i>et al.</i> , 2015) (Mesimäki <i>et al.</i> , 2017) (Rall <i>et al.</i> , 2017)
	Gender equity	
	Feeling of collective activity	
Enhancement of Equality	Empower disadvantaged groups	(Camps-Calvet <i>et al.</i> , 2015)
	Reduce social isolation	(Heckert and Rosan, 2016)
Growth of employment	Employment opportunities in recreation, nature protection and nature tourism	(De Vreese <i>et al.</i> , 2016) (Mononen <i>et al.</i> , 2016)
Education development	Provide formal education opportunities	(Demuzere <i>et al.</i> , 2014) (Ribeiro & Ribeiro, 2016) (Dou <i>et al.</i> , 2017)
	Provide informal learning opportunities about nature	
	Raise awareness on nature conservation	
Safety advancement	Increased perception of safety	(Demuzere <i>et al.</i> , 2014) (Kabisch and Haase, 2014) (Karrasch, Klenke and Woltjer, 2014) (Heckert and Rosan, 2016) (Meerow and Newell, 2017)
	Increased coping capacities/resilience with climate change	
Regeneration of urban areas	Convert brownfield to green areas in urban regeneration projects	(Xiang <i>et al.</i> , 2015) (Yan <i>et al.</i> , 2019) (Egusquiza <i>et al.</i> , 2019) (Premius <i>et al.</i> , 2002) (Norzailawati <i>et al.</i> , 2015)
	Reuse of abandoned areas (e.g. Highline NY)	
	Increase in property values	
Increase in business attraction	Companies investing in city	
	Creation of new job opportunities	
Increase in tourism attraction	Increase of tourism flow within the city	(Duan <i>et al.</i> , 2018) (Terkenly <i>et al.</i> , 2017) (Pan <i>et al.</i> , 2018)
	Increase of use of hotels, Airbnb, etc.	
Job creation	Creation of job opportunities	(Edwards <i>et al.</i> , 2013)
Increase in energy efficiency	Support energy efficiency in building design and layout, building form, infiltration and ventilation, insulation, heating and lighting	(Hemphill <i>et al.</i> , 2004) (Perez <i>et al.</i> , 2016) (Ferreira <i>et al.</i> , 2012) (Ascione <i>et al.</i> , 2013)
Improvement of city imagine	Attraction of new events	(Staddon <i>et al.</i> , 2018) (Mell, 2016)
	Awards recognition	

Table 3: Social and economic benefits of NBS at the urban level

Front-runner cities: Valladolid, Liverpool, and Izmir will be asked to rate the performances of each NBS that has been implemented through the URBAN GreenUP project on the benefits listed above. Cities can rate the benefits generated by the NBS giving a score by 0 to 10. The results will be resumed in a table in which each NBS will be related to the possible effects generated from their implementation.

At the same time, a survey will be distributed to the citizens to assess the impact of NBS. The survey is based on 13 questions at it will allow to understand what perception citizens have of



nature. The following table (Table 4) summarizes the questions included in the survey that will be distributed to citizens.

1	General information of the interviewee Name and Surname Age Job City of residence Area of the city (specify if you live close to one of the NBS implemented)
2	Are you aware about the URBAN GreenUP project? YES/NO
3	How do you rate the initiative? Give a rating from 0 to 10
4	Do you know the solution XX? YES/NO
5	How much does the solution contribute to improving the attractiveness of the area? Give a rating from 0 to 10
6	How much does the solution contribute to preserve the cultural heritage of the area? Give a rating from 0 to 10
7	How much does the solution contribute to increase the recreational opportunities? Give a rating from 0 to 10
8	How much does the solution contribute to increase the interaction between people? Give a rating from 0 to 10
9	How much does the solution contribute to increase the comfort and well-being of the area? Give a rating from 0 to 10
10	Does the solution contribute to improve the security of the area? Give a rating from 0 to 10
11	Does the solution contribute to the area development? Give a rating from 0 to 10



12	Does the solution contribute to the improvement of the businesses of the area? Give a rating from 0 to 10
13	What tax increase are you willing to accept for the maintenance/implementation of the solution? 0 euros 0 - 5 euros 5 - 10 euros 10 - 25 euros 25 - 50 euros More than 50 euros

Table 4: Survey for NBS benefits assessment in front-runner cities

As already said, the surveys will be distributed to the officer and the citizens of the front-runner cities. Data will be used to assess the benefits generated by NBS implemented in the context of the URBAN GreenUP project by taking into account the point of view of municipalities and citizens.

The survey will be translated and distributed with the support of URBAN GreenUP partners.



6 Conclusions and next steps

This report provides an update of the strategy and plan that will be implemented for the exploitation and market deployment of URBAN GreenUP results. Through the deliverable it has been possible:

1. to identify the target audience (see section 2);
2. to collect the project exploitable results (see section 3);
3. to set the basis for the development of the results exploitation assessment for private and public stakeholders (see section 4);
4. to define the survey to be distributed to front-runner cities and to citizens to assess the social and economic benefits generated by NBS (see section 5).

Project partners will be involved to develop the next steps of the exploitation strategy. In particular, it will be necessary to involve them in the update of the exploitable results, in the assessment of the exploitation potential of the project results and in the assessment of the social and economic benefits generated by NBS in front-runner cities.

The table that has been created for the description of the project results will be updated and a final version will be provided in D 7.7 “Report on the exploitation strategy for public and private bodies” taking into account the different sections that have been individuated: i) Exploitable results, ii) Partners and IPR, iii) TRL, Marketability & Replicability; iv) Exploitation activities; v) Barriers to exploitation. At the same time, it will be necessary to assess the exploitation potential of the project results. To achieve this goal, two workshops will be organized involving internal stakeholders – URBAN GreenUP project partners - and external stakeholders through the creation. In this way, it will be possible to assess the exploitation potential taking into account all target audiences individuated. Finally, the assessment of the social and economic benefits generated by NBS will be performed through two surveys that will be distributed to the front-runner cities and to the citizens.

The following table summarizes the activities plan that will be carried out during the URBAN GreenUP project to finalize the exploitation activities of the project.

Activity	Stakeholders involved	Schedule
Exploitable results workshop	UGUP partners	Project meeting 2021
Focus groups for the assessment of exploitable results for public sector	UGUP partners and external stakeholders	2021/2022
Focus groups for the assessment of exploitable results for public sector	UGUP partners and external stakeholders	2021/2022
Assessment of social and economic benefits of NBS (front-runner cities)	UGUP partners	End of the project
Assessment of social and economic benefits of NBS (citizens)	External partners	End of the project
D7.5: Table of exploitable results, business models, and financial instruments to implement NBS for the private sector	UGUP partners	M60



D7. 6: Table of exploitable results and related business models and financial instruments to be used to implement NBS for the public sector	UGUP partners	M60
D7.7: Report on the exploitation strategy for public and private bodies	UGUP partners	M60

Table 5: Exploitation strategy activities plan

7 Annex I

EXPLOITABLE RESULTS								
Filed by	Result number	Name of result	Individual vs Joint	Description of result	Type of result	Other type of result	Comments	Marketability
VAL	1	Planting trees	I	Increasing the number of trees along the SubDemos in the city of Valladolid (VAc2 Planting 1,000 trees, VAc3 Tree shady places (500 trees), VAc5 Re-naturing parking trees (250), VAc4 Shade and cooling trees (600 trees).	NBS	/	/	Non-commercial
VAL	2	Green roof in El Campillo Market: Traditional and Lanaland substracts	J	The VAc28 Green Roof is installed in El Campillo municipal Market. This solution integrates two different substrates for vegetation development: A traditional system (for both an intensive or extensive exploitation), and an innovative substrate compound by sheep wool, which is currently waste. This innovative substrate is being developed as a prototype for a local project for Circular Economy named "Lanaland". This project was granted by Valladolid City Council in 2018. This system is developed by a local start-up called "SBioRN", about biotechnical and constructive solutions.	NBS	/	/	Commercial
VAL	3	Green shady structures: The hanging green canopies and sustainable lightning for Santa María Street	J	The green canopies for Santa María Street (VAc29 Green Shady Structures) are a totally innovative solution designed by SingularGreen, that combines a green infrastructure over a canopy for shadow, and also public lightning in the same structure.	NBS	/	Those vertical gardens are NBS but could be also "Products", commercialized as a whole system	Commercial



VAL	4	Green noise barriers	J	The green noise barriers integrate a green infrastructure (green wall, green garden) with a technical solution for relieving sound noise inconveniences.	NBS	/	Those solutions are NBS but could be also "Products", commercialized as a whole system focused on noise reduction	Commercial
VAL	5	Green façade in El Corte Inglés building	J	El Corte Inglés is a private company that co-implements the Green façade in their department store building in Constitución Street in Valladolid. This is a public-private partnership (PPP).	NBS	/	/	Commercial
VAL	6	Urban carbon sink: Carbon absorption project.	J	The Urban carbon sink of the UGUP project will be a urban forest that increase the carbon sequestration. This intervention will be registered in the Ministry of Ecological Transition directory as a Carbon absorption project for Valladolid municipality.	NBS	/	/	Non-commercial
VAL	7	Urban garden Bio-Filter in the polluted air outlet of a municipal underground car parking (Aparcamientos Españoles SL)	J	The (VAc30) Urban Garden Bio-Filter will extract polluted air from an underground car parking (Plaza Portugalete), and it will be cleaned by natural means (vegetation, soil and a special subtract). The solution is designed by CARTIF Technological Center.	NBS	/	This solution provides also a Service (cleaning air)	Commercial
VAL	8	ElectroWetland	J	The (VAc26) Electro wetland can be described as a constructed wetland-microbial fuel cell, is a new mild wastewater treatment and energy producing technology that has the potential to become a large-scale renewable electricity in-situ producer. The solution is designed by LEITAT Technological Center. This solution has been proved in Lab.	NBS	/	This solution is an advanced technology, that cleans the water	Non-commercial
MAN	9	Resilient green parking areas	J	Creation of a new green parking area intended for exchanger free parking.	NBS	/	/	Both



MAN	10	RUP	J	Integration with other strategic plans for Urban development governance in order to produce a whole-encompassing legislation.	NBS	/	/	Non-commercial
SGR	11	Green shady structures: The hanging green canopies and sustainable lightning for Santa María Street	J	The green canopies for Santa María Street (VAc29 Green Shady Structures) are a totally innovative solution that combines a green infrastructure over a canopy for shadow, and also public lightning in the same structure. The NBS is composed by some textile shades covered with an ultra-light green layer. This coverage brings all the benefits of the green roofs (reduces heat island effect, management of rainwater, increases biodiversity, etc.) in urban areas where there is no space for other kind of NBSs. Also, the product is designed to be easily uninstalled in the case of a fire emergency, so it can be implemented in narrow streets.	NBS	/	/	Commercial
SGR	12	Green noise barriers	J	The green noise barriers integrate a green infrastructure (green wall, green garden) with a technical solution for relieving sound noise inconveniences. The NBS offers the benefits of the noise barriers with the landscaping features of green walls.	NBS	/	/	Commercial
LEI	13	Electrowetlant technology	I	The final design of the technology and the validation of its performance in Urban Green UP project will be potentially exploited by LEITAT to collaborate with wastewater treatment companies in order to standardize the technology and place it in the market by its implementation in real constructed wetland-based wastewater treatment plants.	NBS	/	/	Commercial
BIN	14	Restoring mangrove ecosystems	J	Restoration of the degraded mangrove ecosystem in the urban fringe of Quy Nhon city.	NBS	/	/	Both



CAR	15	Urban Forest as part of Floodable park	J	Design bases for the park and multi-criteria selection for forest species focused in their Carbon Storage capacity.	NBS	/	/	Both
CAR	16	Urban Garden Biofilter	J	Design bases for a biofilter for air pollutants coming from indoor car parks and tunnels.	NBS	/	/	Both
VAL	17	Vertical mobile gardens: 'VALLADOLID' Letters (1 unit), Modules with bench (2 units), Green stackable frames (totem) (14 units)	J	Implementation in the city center of three types of VAc24-Green Vertical mobile garden, and a total of 17 units.	NBS	/	Those vertical gardens are NBS but could be also "Products", commercialized as single units	Commercial
VAL	18	Smart soil as substrate	J	For some interventions there will be used a special substrate with a composition that reduces air pollutants such as NOx. These "Smart soils" are compounded by a 10% biochar, and 90% of sub products (waste), such as garden and pruning waste, or agricultural industry waste (VAc16 Smarts soils as substrate (SubDemoA); VAc17 Smarts soils for GI (SubDemo B); VAc18 Smarts soils as substrate (SubDemo C)).	NBS	/	This special soil is not hard to get and can be sold as new product	Commercial
CFT	19	Vis2D	I	It is helpful to use imagery when engage communities to inform and illustrate how NBS will look in real life. The software package, Vis2D, allows photos to be taken of the city and NBS easily added. The images can be altered to show different perspectives, directions and even how the NBS interventions will look at different times of the year.	NBS	/	Service	Both
CFT	20	Mobile Forest	I	Construction of a mobile forest for promotion and awareness.	NBS	/	/	Both



CFT	21	Urban Catchment Forestry (SUDs design)	J	A bespoke design for Urban Catchment Forestry that positively contribute to reducing flood risk and improving water quality. This encompasses advice on suitable tree species and tree pit design developed to incorporate elements to increase water interception and storage as well as structures to enable water sampling and flow rate monitoring to take place.	Other	Product Model	/	Both
CFT	22	Urban Catchment Forestry hydrograph	J	A localized Urban Catchment Hydrograph is being developed to show the impact of the interventions on the peak water flow and the total volume of water released to the sewer system from the Urban Catchment Forestry intervention. The urban catchments have been mapped.	Other	Product Model	/	Both
LIV	23	Smart Pillar	J	Introduction of pollinators on streetlamp posts that are automatically watered by a solar powered water reservoir. Currently the planting can be for pollution relief, biodiversity gain or for flowers.	NBS	/	/	Commercial
LIV	24	Floating Islands	J	Floating island structures that can be used on lakes and other water bodies to introduce or enhance biodiversity, raise awareness and/or improve water quality.	NBS	/	/	Both
IZM	25	Parklet	I	Parklet installation as the first NBS implementation in Turkey, therefore, its construction techniques and materials has great interest to the other municipal organizations.	NBS	/	/	Non-commercial
IZM	26	Fruit walls, Pollinator Houses, Green Fences, Green Pavement	I	Demo NBS implementation regarding to river restoration and green corridor with variety of other NBSs attracted attention of interested Turkish municipal organizations.	NBS	/	/	Non-commercial
IZT	27	Cool Pavement Green Covering Shelter Green Shady Structures	I	Demo NBS implementation results gives exploitation opportunities for the new research such as heat island effect.	NBS	/	/	Non-commercial



EGE	28	Pollinator houses, Shade and cooling trees	I	The results of NBS implementations can give exploitation opportunities for the further researches, such as urban biodiversity and multiple ecosystem services.	NBS	/	/	Non-commercial
EGE	29	Grassed swales and Water retentions ponds	I	The results of NBS implementations can give exploitation opportunities for the further researches, such as sustainable stormwater facilities (BMPs).	NBS	/	/	Non-commercial
LEI	30	Energy harvesting system	I	The final design of the energy harvesting system and its validation in the Urban Green UP project will be potentially exploited by LEITAT to collaborate with wastewater treatment companies in order to standardize the technology and place it in the market by its implementation in real constructed wetland-based wastewater treatment plants.	Product	/	/	Commercial
LUD	31	Renaturing Urban Plan Ludwigsburg	J	Strategy for the City of Ludwigsburg about replicable results from the URBAN GreenUP Project	Product	/	/	Non-commercial
SGR	32	Vertical mobile gardens: "Valladolid" Letters (1 unit).	J	Implementation in the city center of VAc24-Green Vertical mobile garden. The product is a vertical garden that can be moved to different locations, and has the shapes of the letters of the name of the city with a height of 1.5 m. It is designed to attract the attention on tourist areas, renew unused urban areas, etc.	Product	/	/	Commercial
SGR	33	Vertical mobile gardens: Modules with bench (2 units).	J	Implementation in the city center of VAc24-Green Vertical mobile garden. The product is a vertical garden that can be moved to different locations, and has a bench to be used by the citizens, and a board with the vegetation and some solar fans that can refresh the area surrounding the bench using the cooling power of the plants, so it's a comfort place to stay in summer, for example, in the middle of a public square where there are no places to stay relaxed.	Product	/	/	Commercial



SGR	34	NBS Catalogue	J	The URBAN GreenUP NBS Catalogue, as a base generic catalogue used for this process, includes all possible characteristic of each NBS identified (technical, economic, environmental, and social). The features considered into the catalogue allows the description of the impact of the NBS technology since economic, environmental, social and aesthetical issues, indicating also the potential scale of value for each Climate Challenges described in deep into URBAN GreenUP CC Catalogue. Following, the CC Catalogue links them to the specific KPIs (Key Performance Indicators) to be taken into account in the potential implementation, for its measurement of the behavior and the correct maintenance. The Catalogue indicates also in brief the process in implementation and the stakeholders that take part on it.	Product	/	/	Both
CAR	35	Societal Challenges Catalogue	J	The URBAN GreenUP Climate Change Challenge Catalogue (CC), as a base generic catalogue and data source used for this process, includes the parametrization of each challenge previously identified by the bibliography as well as any other challenge to be identified during the research process. The different items will be included in the database classified hierarchically in Challenges.	Product	/	/	Non-commercial
VAL	36	Legal Aspects Guide	I	The URBAN GreenUP Legal Aspects Guide, as a base guide to evaluate different legal peculiarities, considering different administrative processes, to assist in the implementation of NBS.	Product	/	/	Non-commercial
CFT	37	Zoning Guide	J	The URBAN GreenUP Guide to Actuation Zone, as a base guide to analyze the city zoning, taking into account the aspects on climate change challenge, the city/area diagnosis, the results of the baseline definition and the barriers and boundaries identified.	Product	/	/	Non-commercial



CFT	38	Monitoring sensors: air quality, soil moisture; 'tree piezometers'	J	Small, portable, solar powered sensors for NO2 and PM from PM 1 - PM 10) are being tested as a cheap, portable and accurate method to continuously monitor air quality for key parameters. Opportunities exist to also use similar technology to monitor soil moisture in tree pits.	Other	Product Service	/	Both
RMI	39	Co-creation Guide	I	The URBAN GreenUP Engagement Strategy Guide, as a base guide to evaluate different city ways of co-design and co-developments, gives examples on commitments upfront to identify all relevant stakeholders and community members, and how actively engage them, facilitate the establishment of a "Practitioners steering committee", and generate pathways leading to the establishment of both research-oriented and engagement-oriented Citizen Science programs. One of the outputs is a generic template for a 'NBS Engagement Strategy' that cities can customize, drawing on global experience in engagement and NBS delivery to reflect best practices.	Product	/	/	Non-commercial
GMV	40	Data Collection Procedures	J	This service can be linked with the previous one or can stand alone. The idea is to provide assistance to cities & regions to build and manage a data infrastructure.	Product	/	/	Commercial
CEN	41	Internal exploitation	I	As part of the services that CENTA already offer, this exploitable result can be incorporated into its service portfolio for new construction projects.	Service	/	/	Commercial
MAN	42	Tree board office		Creation of an official group work focused on green maintenance and increasing.	Service	/	/	Non-commercial



VAL	43	Stormwater management systems (SUDs) by CENTA Technological Center: Synergies with the Urban Waterbuffer (UWB) project, by Field Factors	J	The SUDs implemented in Valladolid with the UGUP project (VAc8 SUDs for green bike lane, VAc9 SUDs for re-naturing parking, VAc10 Rain gardens, VAc14 Green Parking Pavements) are designed by CENTA Technological Center. Those interventions established synergies with other projects, such as NAIAD (Horizon 2020). This EU project is coordinated by iCatalist (start-up), and Field Factors is a specialized Dutch company on water management solutions, that is also partner for NAIAD. Valladolid City Council is developing another innovative solution for water management, in synergy with the Stormwater management systems (SUDs) of UGUP project, named "Urban Water buffer Valladolid" (UWB). This alternative project is founded by the Dutch Government (Partners for Water Program). Fields Factors will design an innovative solution for the Zorrilla football stadium. This system will take rainwater from the stadium and the car parking, the water will be cleaned by a natural solution (with bluebloods technology), and the water will be infiltrated underground, as a natural reservoir, and then, the water will be pumped back to the stadium for reuse. Valladolid City Council, Aquavall (public entity for local water management), iCatalist and Field Factors are partners in the UWB Valladolid project.	Service	/	/	Both
IZM	44	Industrial heritage Route (Non-technical)	J	When Industrial heritage route of given NBS in the project. This exploitable result will be used in the future extension of industrial heritage route around Izmir Bay. Additionally, Izmir Metropolitan Municipality will apply to "European Route of Industrial Heritage" as a result of the project's achievement.	Service	/	/	Both



GMV	45	Monitoring Procedures	J	Monitoring Green Infrastructure Services for Cities and regions.	Service	/	/	Commercial
RMI	46	NBS planning and Renature Urban Planning	J	The methodology for renature urban planning as a supplemental product for the NBS implementation to support the green infrastructure or general and specialized planning of the urban area concerning responses to urban and climate challenges.	Methodology	/	/	Non-commercial
UBO	47	ESA methodology for NBS evaluation	I	Methodology for the monetary evaluation of NBS at the urban level based on the concept of ecosystem services. The methodology aims to assess the ecosystem services produced by NBS at the urban level to catch all impact generated by them considering provisioning, regulating, cultural and supporting services.	Methodology	/	/	Non-commercial
IFO	48	Validation and adaptation of the data monitoring framework for D&C activities	I	The result refers to the validation and adaptation of IFO methodology to monitor the impact of communication and dissemination activities of EU projects. The methodology will be validated and adapted to the new renaturing process of cities via nature-based solutions. The methodology builds upon IFO existing approach to data monitoring, which was first proposed in the URBAN GreenUP project proposal and meanwhile validated in other EU funded Smart Cities projects. An upgraded approach, with respect to the initial one proposed in the offer, will provide a series of indicators for the different activities/ publication formats and integrate them into the Community Engagement Index (CEI). This index will calculate the overall impact of all communication and dissemination activities on the community along the entire duration of the project, providing useful inputs on the engagement of stakeholders and citizens with NBS topics.	Other	Model/Service Methodology	/	Both



IFO	49	A more focused local approach and framework to communication in EU smart cities' projects	I	IFO adopted for the first time a more focused local approach in the framework of a European and global sustainable cities' project. Since its first release, the URBAN GreenUP project C&D Plan developed by IFO included a local C&D Plan for each involved city (front-runner and fellow). Cities were involved in the co-design of their local strategy and guided by IFO to select the key ingredients (targets, key messages, channels, formats, timing) to roll out an effective C&D local strategy in line with the project's overarching strategy at EU and international level.	Methodology	/	/	Non-commercial
MAN	50	Lake Bathin project	I	Involvement of local actors in increasing water quality and resilience of "Lago Superiore". This project is related with Mincio with action like creation of hedges and rows, New governance approach.	Methodology	/	/	Non-commercial
MAN	51	Local ecological greed	I	Sharing best practice with other local municipality and sopra municipal planning.	Methodology	/	/	Non-commercial
GMV	52	Handbook of KPIs	J	Robust set of Indicators used to evaluate the performance in different cities of the NBS.	Methodology	/	/	Both
RMI	53	Replication potential	I	Develop analysis system for selection of proper NBS with city's institutional and technical context. Suggestion of most appropriate NBS for consideration under city's constraints. The analysis tool can serve as the screening tools for the NBS replication in other cities outside project.	Model	/	/	Both
UBO	54	Financial instrument for NBS implementation	I	Analysis and description of the most suitable financial instruments for the implementation of NBS at the urban level. Per each instrument, an exhaustive explanation about the main characteristics has been provided and several case studies have been associated to each financial instrument.	Model	/	/	Non-commercial



UBO	55	Business models for NBS implementation	I	The definition and adoption of a business model in cities have been analyzed through a literature review of the best practices and case study of BM for NBS to understand the structure and the characteristics of the successful business models. A template for the assessment framework. The template takes into account all the main features characterizing business models. It is composed by two main blocks: the first one is related with the general information about the project implemented, the objectives and the main challenges faced by the city. The second block is related with the business model: stakeholders involved, description of the value proposition, value delivery and value capture, the cost structures, the revenues etc.	Model	/	/	Non-commercial
CFT	56	GiVal++	I	A toolkit in spreadsheet format that calculates monetary values for the social, economic and environmental benefits that NBS provide.	Other	Product Model	/	Both
RMI	57	City characterization for NBS implementation	I	The developed process provides an assessment framework to support the NBS implementation to meet the targets of the city in response to its various internal and external challenges	Process	/	/	Non-commercial
CFT	58	Asset/pinch point approach	I	This approach identifies the most resource effective approach where to implement NBS based on identified need. It uses GIS data to show where NBS interventions should be targeted.	Other	Model Process	/	Both
GMV	59	Global Evaluation and recommendations	J	Report on the knowledge produced along the project.	Advancement in knowledge	/	/	Non-commercial
UBO	60	Market analysis of European and non-European markets	J	Report on the analysis of the market for NBS in EU and non-EU countries.	Advancement in knowledge	/	/	Non-commercial



IFO	61	Best Practices and recommendations	J	Best practices, lessons learnt, and recommendations will be packaged in a Best Practices book, a final publication reporting best practices for renaturing urban plans and based on the project experiences, achievements and impacts. It will be a necessary tool for replication in other cities.	Advancement in knowledge	/	/	Non-commercial
IFO	62	Insights generated by the C&D activities	J	Knowledge and recommendations packaged into multiple original contents and formats for dissemination and upscaling purposes. Audiovisual production, journalistic articles, factsheet will be among the used formats.	Advancement in knowledge	/	/	Non-commercial
BIN	63	Change in awareness	J	Changing awareness of the protection and development of green infrastructure in Quy Nhon city.	Advancement in knowledge	/	/	Non-commercial
CEN	64	Research	I	Development of further research activities based on NBS will provide valuable information and results on different aspects, such as: engineered design, interaction with land/urban uses or governance.	Advancement in knowledge	/	/	Non-commercial
LEI	65	Research on applicability of NBS (including Electrowetland) for urban wastewater treatment	I	The technical knowledge regarding the Electrowetland technology which LEITAT has acquired during the URBAN Green UP project will be used in future research/ innovation projects.	Advancement in knowledge	/	/	Non-commercial
MAN	66	CITIZENS INVOLVEMENT	I	Involvement of local stakeholder in many events about climate change resilience; increasing of local crowd funding experience in greening actions.	Advancement in knowledge	/	/	Both
MAN	67	STAKEHOLDER INVOLVEMENT	I	Involvement of local public stakeholder about NBS e resilience actions.	Advancement in knowledge	/	/	Non-commercial
MAN	68	Green website	I	Open data platform about green areas of the municipality and ecosystem services.	Advancement in knowledge	/	/	Non-commercial



MAN	69	Green infrastructure project	I	Construction of Climate adaptation guidelines for Mantova with drone flight.	Advancement in knowledge	/	/	Non-commercial
VAL	70	A change of mind: The benefits of NBS	I	The implementation of NBS in the city will demonstrate the effectiveness of those solutions, and this might change local policies in the middle-long term. The policies affected might be: Urban planning, Construction, Housing, Parks and Gardens, Environmental (Air Quality, Noise and Biodiversity).	Other	Advancement in knowledge but also changes in policies	/	Non-commercial
ACC	71	Service to the methodology for Re-naturing Urban Concept (RUP).	I	One of the initial results is the "Final Methodology Guide D1.14" ACC access that is referring to the agreed and described results of the Methodological Process, but at the same time is the Product, Service, Methodology, Process, and advancement in knowledge.	Other	product Service Methodology Model process Advancement in knowledge	/	Both
CAR	72	Scenario generation Tool	J	The URBAN GreenUP NBS generation tool, as a base guide to evaluate different city NBS Scenarios, made up by the selection of one or several NBS alternatives previously identified, working in an integrated way solving various problems. User's inputs will be translated to outputs through calculation matrices modules. These matrices will evaluate the relationship of the NBS with respect to the challenges and to the barriers and limits.	Other	Product Service	/	Both



PARTNERS & IPR							
Filed by	Result number	Partners' involved	Type of access	IP Ownership Background	IP Ownership Foreground	Expected measures to protect IPR	Expected measures to protect IP comment
VAL	1	VAL	Public	None	None	/	There is not any IP protection
VAL	2	VAL, SGR, SBioRN	Public	SBioRN (Biotechnology Systems and Natural Resources) www.sbiorn.com developed the sheep wool lab prototype, and a simple implementation in their facilities in Valladolid. This is the previous experience for 'Lanaland', that will be built at real scale in El Campillo Market http://www.sbiorn.com/lanaland.html	Any result for Lanaland might be exploited by SBioRN.	Soft IP	Valladolid City Council does not know if SBioRN is protecting the Lanaland System by IPR. Soft IP is an assumption, because of the know-how and scientific/investigative value of the solution.
VAL	3	VAL, SGR	Public	This solution was tested by SGR in their headquarters (Alicante, Spain) but also in the NBS Lab in CARTIF Technological Center (Boecillo, Valladolid).	The solution will be tested on a real stage. SingularGreen, architects, will get the experience for improving the design and effectiveness of the solution.	/	Unknown if the solution is or will be protected by SGR
VAL	4	VAL, SGR	Public	There is not any known previous experience, even designed by SGR or other examples.	The solution will be tested on a real stage. SingularGreen and architects will get the experience for improving the design and effectiveness of the solution.	/	/
VAL	5	VAL, SGR, El Corte Inglés	Public	SGR have previous experience on designing and implementing green	None	/	/



				infrastructure, such as this green wall.			
VAL	6	VAL, CAR	Public	Valladolid City Council owns another urban carbon sink in the municipality, 'El Bosque de los Sueños', (The Forest of Dreams), built with a LIFE+ project "Quick Urban Forest".	This project will be registered in the Ministry of Ecological Transition directory as a Carbon absorption project for Valladolid municipality. The results of the selected arboreal species generate valuable knowledge.	/	There is not any IPR protection, but this project will be registered in the Ministry of Ecological Transition of Spain
VAL	7	VAL, CAR	Public	CARTIF Technological Center proved the Biofilter solution in their laboratory (Boecillo, Valladolid), in a small scale.	CARTIF Technological Center will demonstrate the effectiveness of the solution with a real tested prototype in Valladolid.	/	Unknown if the solution is or will be protected by CARTIF.
VAL	8	VAL, LEI	Public	LEITAT has previous experience on implementing an Electrowetland in their Laboratory (Terrassa, Barcelona).	LEITAT Technological Center will demonstrate the effectiveness of the solution with a real tested prototype in Valladolid.	/	Unknown if the solution is or will be protected by LEITAT.
MAN	9	/	/	/	/	/	/
MAN	10	/	/	/	/	/	/
SGR	11	VAL and SGR. We are going to register under the mark "Green Shades"	Private	/	/	IP - Trademarks	/
SGR	12		Private	/	/	/	/
LEI	13	LEI	Private	LEI	LEI	Soft IP	/
BIN	14	Binh Dinh Provincial, Quy Nhon City, Urban Development Company	Private	CCCC Binh Dinh	CCCO Binh Dinh	Copyright	Non
CAR	15	CAR, VAL, CHD	Public	/	/	Soft IP	



CAR	16	CAR, VAL	Public	CAR	CAR	Soft IP	Process ongoing
VAL	17	VAL, CEN, Aquavall, Field Factors, iCatalist	Public	CENTA Technological Centre has previous experience with water management. Field Factors and iCatalist developed the NAIAD project (www.naiad2020.eu). The solution was previously implemented in the Sparta Stadium, Rotterdam (https://fieldfactors.com/en/projects/urban-waterbuffer-spangen).	Field Factors is the owner of the Bluebloos technology.	/	Unknown if the solution is or will be protected by Field Factors.
VAL	18	VAL, CAR	Public	CARTIF Technological Center (Boecillo, Valladolid) designed the Smart Soil composition and properties.	The solution will be tested on a real stage (close to 900 m ³ soil), but monitoring results and effectiveness might be difficult.	/	Unknown if the solution is or will be protected by CARTIF.
CFT	19	CFT/LIV/Aeternum Ltd (local developers)	Private	The current prototype remains in the ownership of the developing company Aeternum Ltd.	/	IP - Patents	Aeternum Ltd own copyright and intellectual property.
CFT	20	CFT: LIV; others	Public	The current design and prototype has been commissioned by CFT.	/	Soft IP	/
CFT	21	CFT; LIV; others	Public	The current tree SuD has been designed with a range of partners to customize it for project use and testing. The basic tree pit design is owned by Deep Root and CFT and the city council have amended some aspects to improve it for the testing location.	Deep Root owns the existing IP and design for this product which we have customized.	Soft IP	/
CFT	22	CFT; LIV; others	Public	Some of the data sets on catchment may be owned by utility or water companies.	/	Soft IP	/
LIV	23	LIV; others	Public	The current design and IP are owned by Scotscape Ltd.	/	IP - Patents	/



LIV	24	LIV, others	Public	The island design and IP are owned by Biomatrix Ltd.	/	IP - Patents	/
IZM	25	Izmir Metropolitan Municipality, Izmir Foundation, Izmir Chamber of Commerce, Izmir Development Agency, Izmir Universities	Public	Izmir Metropolitan Municipality	Izmir Metropolitan Municipality	IP - Trademarks	/
IZM	26	Other Turkish Metropolitan Municipalities	Public	Izmir Metropolitan Municipality	Izmir Metropolitan Municipality	IP - Industrial design	/
IZM	27	Other Turkish Metropolitan Municipalities	Public	Izmir Metropolitan Municipality	Izmir Metropolitan Municipality	Copyright	/
EGE	28	Ege University and Other Izmir Universities	Public	Ege University-Landscape Architecture Department	Ege University-Landscape Architecture Department	/	/
EGE	29	Ege University and Other Izmir Universities	Public	Ege University-Landscape Architecture Department	Ege University-Landscape Architecture Department	/	/
LEI	30	LEI	Private	LEI	LEI	Soft IP	
LUD	31	RMIT University of Vietnam, indirect: Front-Runner Cities	Public	Front-Runner Cities	City of Ludwigsburg	Soft IP	No measures necessary
SGR	32	VAL and SGR.	Private	/	/	/	



SGR	33	VAL and SGR. We are going to register under the mark "Urban Biofilter"	Private	/	/	IP - Trademarks	/
SGR	34	SGR, WP1 PARTNERS	Public	/	/	Soft IP	/
CAR	35	CAR, WP1 PARTNERS	/	/	/	/	/
VAL	36	VAL	/	/	/	/	/
VAL	37	VAL, SGR	Public	None	None	/	Unknown if the solution is or will be protected by SGR
CFT	38	LIV, CFT	/	/	/	/	/
CFT	39	CFT; LIV; others	Public	The current ownership of the product is with CFT	/	IP - Patents	CFT own current product
RMI	40	RMIT	Public	Methodology and contents serving as a guide to public and consultancy services	/	Soft IP	/
GMV	41	ALL	Private	/	/	/	/
CEN	42	CENTA	Private	CENTA	CENTA	IP - Trademarks	/
MAN	43	/	/	/	/	/	/
GMV	44	ALL	Private	/	/	/	/
RMI	45	CAR,VAL,CHD,LIV, CFT,IZM,DEM,EG E,IZT,SPI,MAN,LU D,MED,BIN	Public	RMIT	RMIT	Soft IP	/
UBO	46	UBO	Public	VAL, LIV, IZM and their technical partners	VAL, LIV, IZM and their technical partners	Soft IP	/



IFO	47	IFO	Private	IFO	IFO	Soft IP: Confidential information	The methodology is proprietary and protected by Copyright in publications and Soft IP (confidential information, company know-how).
IFO	48	IFO, cities	Private	IFO	IFO	Soft IP: Company Know-how	The new approach will be protected as company know-how in IFO D&C activities involving local communities.
MAN	49	/	/	/	/	/	/
MAN	50	/	/	/	/	/	/
GMV	51	ALL	Public	/	/	/	/
RMI	52	CAR,VAL,CHD,LIV, CFT,IZM,DEM, EGE,IZT,SPI,MAN, LUD,MED,BIN	Public	RMIT	RMIT	IP - Utility models	/
UBO	53	UBO	Public	/	/	Soft IP	/
UBO	54	UBO	Public	/	/	Soft IP	/
CFT	55	CFT; LIV; others	Public	The current prototype is free and open source, and can be downloaded right here under a Creative Commons License: https://www.merseyforest.org.uk/services/gi-val/	/	Soft IP	/
RMI	56	CAR,VAL,CHD,LIV, CFT,IZM,DEM, EGE,IZT,SPI,MAN, LUD,MED,BIN	Public	RMIT	RMIT	Soft IP	/
CFT	57	CFT; LIV; others	Public	The current methodology and approach have been developed by CFT and uses publicly available information and mapping data.		Soft IP	/



GMV	58	ALL	Public	/	/	/	/
UBO	59	UBO, RMIT, SPI	Public	VAL, LIV, IZM, MAN, LUD, MED	VAL, LIV, IZM, MAN, LUD, MED	Soft IP	/
IFO	60	IFO, cities, technical partner	Public	IFO, All	IFO, All	N. A.	N. A.
IFO	61	IFO, all	Public	IFO, All	IFO, All	/	N. A.
BIN	62	Binh Dinh Provincial, Quy Nhon City, Urban Development Company	Public	CCCO Binh Dinh	CCCO Binh Dinh	Soft IP	Non
CEN	63	CENTA	Public	CENTA	CENTA	Copyright	/
LEI	64	LEI	Private	LEI	LEI	Copyright	/
MAN	65	/	/	/	/	/	/
MAN	66	/	/	/	/	/	/
MAN	67	/	/	/	/	/	/
MAN	68	/	/	/	/	/	/
VAL	69	VAL	Public	Demonstrative projects such as URBAN GreenUP.	Generate knowledge and proved experiences of the NBS benefits.	/	The IP will not be protected.
IZT	70	Ege University and Other Izmir Universities	Private	Izmir Institute of Technology	Izmir Institute of Technology	Copyright	/
ACC	71	WP1 partners CAR, CFT, DEM, RMIT, VAL	Methodology modules on: CAR, CFT, DEM, RMIT, VAL	Methodology logic structure and contents, bases to consultancy services.	Methodology related bases, diagnosis and baseline definition in link to the different scenarios' definition, KPIs, zoning, legal, co-creation and replication.	IP - Utility models	Copyright
CAR	72	WP1 partners	Public	/	/	Soft IP	/



TRL, MARKETABILITY & REPLICABILITY								
Filled by	Result number	TRL M0	TRL M60	Readiness at M60	Market readiness comment	Year of commercialization/ availability	Replicability/ Upscaling	Replicability/Upscaling comment
VAL	1	N.A.	N.A.	N.A.	/	/	Yes	Increasing the number of trees can be replicated in other zones of the city, out of the SubDemos or the UGUP project.
VAL	2	TRL 5	TRL 7	Medium	The innovative substrate 'Lanaland' made from sheep wool waste will be tested during the URBAN GreenUP project in the green roof of El Campillo Market in Valladolid. After the project, the solution might be improved, and ready to be replicated. However, market might be not ready for using that solution, as the basis is sheep wool.	End of the project	Yes	After the project, the solution might be improved, and ready to be replicated.
VAL	3	TRL 4	TRL 7	High	The effectiveness of the solution will be demonstrated after UGUP project.	End of the project	Yes	This solution can be replicated in other streets, areas, cities, etc. But the design must be adapted to the alternative location. Other cities/local entities (Murcia Region, Catalonia) and some private companies (Spanish Parks and Gardens Association) are already interested on having more information about the Green canopies.
VAL	4	TRL 3	TRL 7	Medium	The effectiveness of the solution will be demonstrated after UGUP project.	End of the project	Yes	/
VAL	5	TRL 8	TRL 8	High	This solution (green wall) is not new and can be easily replicated in other areas.	/	/	Some private companies asked to the City Council who could design and construct vertical gardens such as the green walls (Amalgama Concept Store).



VAL	6	N.A.	N.A.	High	This urban forest will demonstrate the effectiveness of those solutions in the urban spaces for a long life, as an official Absorption Project for the Ministry must be preserved for at least 30 years.	End of the project	Yes	This solution can be replicated in other urban areas, in Valladolid and other cities and regions.
VAL	7	TRL 4	TRL 7	Medium	The market might be ready for the solution. The effectiveness of the solution must be proved first.	1 year after the end of the project	Yes	This solution has a huge potential for replicating, as the Biofilter can be extended to any polluted air outlet (other underground car parking, industries, private companies, private buildings, etc.)
VAL	8	TRL 4	TRL 7	Low	The technology should improve the energy generation, as well as treated water quality, as this cannot be reused (for legal fulfillments).	2 years after the end of the project	Yes	Highly technological. The effectiveness of the results are less beneficiary: the water cannot be reused unless an extra tertiary treatment is provided, the generation of electricity is small, etc.
MAN	9	/	/	/	/	/	/	/
MAN	10	/	/	/	/	/	/	/
SGR	11	TRL 3	TRL 9	High	/	End of the project	Yes	/
SGR	12	TRL 1	TRL 9	High	/	End of the project	Yes	/
LEI	13	TRL 4	TRL 6	High	/	3 years after the end of project	Yes	The validation of the technology Electrowetland at demoscale and at relevant environmental during a period of 2 years will allow its replicability/upscaling at real scale.
BIN	14	N.A.	N.A.	N.A.	/	End of the project	Yes	Can expand the scope of the whole Binh Dinh province
CAR	15	N.A	NA	NA	/	End of the project	YES	The system can be used in other floodable parks.
CAR	16	TRL 6	TRL 9		/	End of the project	YES	This NBS can be used for any indoor car park or tunnel in urban areas.



VAL	17	TRL 8	TRL 8	High	UWB has been also implemented in Rotterdam (The Netherlands). So the market is ready for the solution, with available successful study cases.	End of the project	Yes	The system is been upscaled in Valladolid. This can be replicated in other areas, which comply with the technical specifications about the location, wastewater generation, rain, etc.
VAL	18	TRL 6	TRL 7	Medium	Market is already using substrates deployed with sub products, such as compost. Potential users should be close to the providers, to reduce transport expenses.	End of the project	Yes	The composition of the Smart soil is easy to replicate, as there are many possibilities for using sub products.
CFT	19	TRL 2	TRL 9	High	Sensors should be established and tested against other source measurements by month 60.	End of the project	Yes	Able to be used and moved as required - requires LoraWan to push the data which can be displayed on a customized dashboard.
CFT	20	TRL 2	TRL 9	High	Plans for construction and operation will be available.	End of the project	Yes	Replicability potential is good as it has attracted much interest and can be delivered and reused at a low cost. Upscaling is possible with a small cluster of units in a single location.
CFT	21	N.A.	N.A.	High	The main amendments to the design are to include a larger soil volume and to permit testing in situ.	End of the project	Yes	The amendments made and tested in the project can be incorporated into subsequent works.
CFT	22	N.A.	N.A.	High	It is expected that the hydrograph process will be something that is replicable in other catchments and for other projects.	End of the project	Yes	The mapping of the hydrograph should provide a background against which benefits of NBS can be clearly demonstrated. This can be replicated for different locations and situations.
LIV	23	TRL 2	TRL 9	High	The company are already manufacturing units for other interested partners.	End of the project	Yes	The units are already in situ in the UK and are being promoted through this project. Opportunities exist for replicability and upscaling.



LIV	24	TRL 7	TRL 9	High	The company already produce islands for other interested partners	End of the project	Yes	If the islands work well there is opportunity to upscale their use in the city and to replicate elsewhere.
IzM	25	N.A.	N.A.	N.A.	/	End of the project	Yes	This route will be extended to be a part of city-wide tourism networks. This route could also be integrated with local nature observation routes in the same area and could be one of the inputs in the upcoming Izmir city-wide Tourism Strategy.
IzM	26	N.A.	N.A.	N.A.	/	End of the project	Yes	Construction material and design of parklets (as demo NBS implementation) have value for municipalities to attract more walking and cycling.
IzM	27	N.A.	N.A.	N.A.	/	End of the project	Yes	1.2 km long river restoration project with variety of related NBS may help implementers to see the cumulative impact of whole process.
EGE	28	/	/	/	/	End of the project	N.A.	/
EGE	29	/	/	/	/	End of the project	N.A.	/
LEI	30	TRL 3	TRL 6	High	/	2 years after the end of the project	Yes	The validation of the Energy harvesting system at demo scale and at relevant environmental during a period of 2 years will allow its replicability/upscaling at real scale.
LUD	31	N.A.	N.A.	High	/	End of the project	Yes	/
SGR	32	TRL 7	TRL 9	High	/	End of the project	Yes	/
SGR	33	TRL 1	TRL 9	High	/	End of the project	Yes	/
SGR	34	N.A.	N.A.	High	The NBS is already available. The catalogue is not made to take an economic direct benefit of it, but it can be useful to stablish new	End of the project	N.A.	The NBS catalogue has been prepared to be applied in many different cases along the world.



					relations between different partners involved, like city councils and SMEs,			
CAR	35	/	/	/	/	/	/	/
VAL	36	/	/	/	/	/	/	/
VAL	37	TRL 7	TRL 7	High	This NBS is not a technological solution (TRL), but can be commercialized and available in the market.	End of the project	Yes	The different Mobile gardens implemented in Valladolid and designed by SGR could be commercialized.
CFT	38	/	/	/	/	/	/	/
CFT	39	TRL 5	TRL 8	High	The basic version is already operational, and licenses can be issued.	End of the project	Yes	Able to be used for various street scenes or locations. Simple and easy to use.
RMI	40	N.A.	N.A.	N.A.	The co-creation guide serving the integration of stakeholders at various phases of NBS implementation from planning, internal and external consultation, evaluation and assessment of the NBS planning at city level.	End of the project	Yes	Services and guides related.
GMV	41	TRL 9	TRL 9	N.A.	/	N.A.	Yes	Yes
CEN	42	N.A.	N.A.	N.A.	/	N.A.	Yes	Technical interventions designed for URBAN GreenUP can be widely replicated.
MAN	43	/	/	/	/	/	/	/
GMV	44	TRL 6	TRL 7	N.A.	/	N.A.	Yes	Yes
RMI	45	N.A.	N.A.	Medium	/	End of the project	Yes	/
UBO	46	N.A.	N.A.	High	/	N.A.	Yes	/
IFO	47	N.A.	N.A.	High	The adapted framework to a NBS environment will be fully usable at the end of the project.	End of the project	Yes	The methodology can be upgraded and extended to other projects, research areas and domains, communication campaigns.
IFO	48	N.A.	N.A.	High	The approach can be easily replicated in other projects.	End of the project	Yes	The methodology for the design of the C&D strategy can upscaled and readapted for new EU-funded projects.



MAN	49	/	/	/	/	/	/	/
MAN	50	/	/	/	/	/	/	/
GMV	51	TRL 6	TRL 7	N.A.	/	End of the project	Yes	Yes
RMI	52	N.A.	TRL 1	Medium	/	End of the project	Yes	/
UBO	53	N.A.	N.A.	High	/	N.A.	Yes	/
UBO	54	N.A.	N.A.	High	/	N.A.	Yes	/
CFT	55	N.A.	N.A.	High	The basic version is already available but future improvements are anticipated to the model as part of the wider project.	End of the project	Yes	The model is well established and used already. Improvements are likely to increase the opportunity of both replicability and upscaling use.
RMI	56	N.A.	N.A.	Medium		End of the project	Yes	/
CFT	57	N.A.	N.A.	High	The current version has been used in Liverpool and aspects are being incorporated within the project methodology approach as well as being piloted with other cities.	End of the project	Yes	The project methodology seeks to incorporate elements of this approach to help select the most appropriate NBS. Follower cities are expected to further test and replicate this approach.
GMV	58	N.A.	N.A.	N.A.	/	End of the project	Yes	Yes
UBO	59	N.A.	N.A.	N.A.	/	N.A.	N.A.	/
IFO	60	N.A.	N.A.	High	The recommendations will be fully usable by the end of the project.	End of the project	Yes	The contents can be replicated and reused by other cities
IFO	61	N.A.	N.A.	High	All Insights generated are available for reuse.	End of the project	Yes	Content packaging into specific formats will be easily exploited by third parties. Video footage will be reused and reedited by other TV journalists and editors, as the footage and story are not protected by copyright. The footage will also be re-used by IFO for other video productions on NBS, urban sustainability, climate change topics. IFO will collect insights and knowledge both internally via the consortium partners and externally via other experts and opinion leaders for the production of articles and



								other publications as well as for the packaging. The knowledge collected and processed in different formats for dissemination purposes as well as the open dialogue with new stakeholders engaged in the project's networking activities will increase IFO's and other URBAN GreenUP beneficiaries knowledge background and enlarge their network that can be activated for new projects or for research purposes.
BIN	62	N.A.	N.A.	N.A.	/	End of the project	Yes	Can expand the scope of the whole Binh Dinh province.
CEN	63	N.A.	N.A.	N.A.	/	N.A.	N.A.	/
LEI	64	N.A.	N.A.	N.A.	/	N.A.	N.A.	/
MAN	65	/	/	/	/	/	/	/
MAN	66	/	/	/	/	/	/	/
MAN	67	/	/	/	/	/	/	/
MAN	68	/	/	/	/	/	/	/
VAL	69	TRL 1	TRL 3	Low	Political changes expected in the middle-long term	4 years after the end of the project	No	/
IZT	70	N.A.	N.A.	N.A.	/	N.A.	N.A.	Measurements in demo NBS implementations may help to production of city climate adaption plan and associated strategies (i.e. green infrastructure).
ACC	71	TRL 2	TRL 7	High	No specific RUP methodology available (open source)	End of the project, 1 year after the end of the project	Yes	Services and Guides Related
CAR	72	N.A	NA	NA	/	End of the project	Yes	They could be replicated in other scenarios



EXPLOITATION ACTIONS							
Filled by	Result number	Planned use: partner's exploitation strategy	Target users	Management	Channels	Partners	Value proposition
VAL	1	Potential for replication in other parts of the city. Political purposes.	Citizens	Own management: Valladolid City Council.	Physical implementation of arboreal species.	None	Environmental and Health benefits.
VAL	2	Scientific purposes: implementation of an innovative solution as subtract for a green roof.	Citizens, Architects, Industrial Research Organizations	PPP	Promoting the results of implementation (Social media, forums, seminars, etc.)	SGR, VAL, SBioRN	Development of the local Circular Economy. Support to local economic entities. Green jobs.
VAL	3	Create local expertise. Increase economic benefits for the area, such as more visitors.	Shops/Commerce, citizens	Own management: Valladolid City Council (Parks and Gardens Service, Innovation Area).	Promoting the results of implementation. Specific local campaigns for the solution.	SGR, VAL	Increase the value of the street and the neighborhood. Create green jobs. Generate green expertise, especially for local business.
VAL	4	Create local expertise. Increase economic benefits for the area, such as more visitors.	Citizens	Own management: Valladolid City Council (Parks and Gardens Service, Mobility Area, Innovation Area).	Promoting the results of implementation (Social media, forums, seminars, etc.). Specific local campaigns for the solution.	SGR, VAL	Health benefits for the citizens who live in the nearby buildings (noise will decrease). Other environmental benefits. Green jobs.
VAL	5	Political purposes. Study case for a successful Public-private partnership. We expect this solution to be replicated by other private investors in other places, even El Corte Inglés in other department stores.	Commerce (El Corte Inglés, SL), citizens	Own management: Valladolid City Council (Innovation Area). Private management: El Corte Inglés SL Department stores.	Promoting the results of implementation. Take advantage of the potential to collaborate with a private company with the potential of El Corte Inglés in Spain, and internationally (department stores).	SGR, VAL, EL Corte Inglés	Environmental and Health benefits. Economical value for a private company (jobs for the citizens, gross value for the city, etc.). Green jobs. Dissemination and engagement.



VAL	6	Environmental purposes for the city. Political purposes.	Citizens	Own management: Valladolid City Council	Promoting the results of implementation	CAR, VAL	Environmental and Health benefits.
VAL	7	Create local expertise. Create new business opportunities for local or foreign companies. Scientific purposes. Develop a PPP	Citizens, Academic organizations, Environmental associations, Industry and SMEs	Own management: Valladolid City Council (Parks and Gardens Service, Innovation Area)	Promoting the results of implementation (Social media, forums, seminars) PPP with Aparcamientos Españoles SL	CAR, VAL, Aparcamientos Españoles SL	Environmental and Health benefits. Create expertise. Support entrepreneurs in new business models.
VAL	8	Scientific purposes.	Academic organizations	Own management: Valladolid City Council (Parks and Gardens Service, Aquavall, Innovation Area)	Promoting the results of implementation (Social media, forums, seminars, etc.).	LEI, VAL	Environmental benefits. Scientific purposes (prototype implemented in a real scenario, not a Lab).
MAN	9	/	/	/	/	/	/
MAN	10	/	/	/	/	/	/
SGR	11	Commercialization of Green Shades.	Municipalities, City Council and city administration. Architects. Local communities. Academic organizations. Industry and SMEs. Environmental associations.	Own management.	Website, social media, public tendering.		Purifies the air, contributes to reduction of heat wave effect, helps on rainwater management, reactivates public spaces and increases biodiversity.
SGR	12	/	Municipalities, City Council and city administration	Own management.	Website, social media, public tendering.		



LEI	13	LEITAT technical knowledge and acquired results will be used in different market initiatives with the aim to collaborate with wastewater treatment companies in order to standardize the technology and place it in the market by its implementation in real constructed wetland-based wastewater treatment plants. The exploitation routes of LEITAT's technological developments are through licensing the technology; offering R+D services and/or creating partnerships to launch the Electrowetland technology.	Industry and SMEs; Environmental associations;	Partnerships and/or other agreements with other stakeholders; Activities carried out by an existing unit within existing organization.	Sales channels	Wastewater treatment companies; Environmental organizations; City councils	The Electrowetland technology, when compared to conventional horizontal subsurface constructed wetlands is able to generate electricity by means of the electrodes integrated within the treatment bed. This electricity can be used to power low input devices such as sensors.
BIN	14	Use for purposes: science, research, economics	Municipalities, City Council and city administration; City services companies; - Citizens - Local communities - Urban Planners; - Environmental associations; - Academic organizations; - Students and Trainees; - Industry and SMEs; - Eu projects - NGOs	Agree to the broadcasting schedule of the results achieved with the local Broadcasting Station and the Newsroom.	Binh Dinh Radio and Television; Binh Dinh newspaper	NGOs; International, Regional and Multilateral Organization	Restoring mangrove ecosystems in suburban areas to improve green infrastructure and enhance resilience to suburban areas with climate change.



CAR	15	This model can be offered as service/design support	Public administration	Service	Risk management, air quality in cities, zero carbon cities	CAR	/
CAR	16	Design and management	Public administration	Service	Risk management, air quality in cities, zero carbon cities	CAR	/
VAL	17	Scientific purposes: implementation of a in innovative solution for water management. Economic objective: Get international funds for implementing water management solutions	Citizens, Industry and SMEs, Urban planners, EU projects, International organization (Dutch Government), Academic organization (iCatalist); City services companies (Aqavall), Utility providers	Own management: Valladolid City Council (Innovation Area, Aquavall, Parks and Gardens). Private management: Real Valladolid Football Club. Field Factors, iCatalist.	Promoting the results of implementation (Social media, forums, seminars, etc.). Take advantage of the potential to collaborate with a private company.	CEN, VAL, Aquavall, Field Factors, iCatalist	Environmental benefits for reusing water that is removed from the sewage. Associated economic benefits. Scientific demonstration. Green jobs. Dissemination and engagement.
VAL	18	Economic purposes, such as encourage local and regional providers.	Industry and SMEs, citizens	Own management: Valladolid City Council (Parks and Gardens Service, Innovation Area)	Promoting the benefits of the Smart Soils among the Parks and Gardens Service and the Urbanism Area, as they are the City Council main buyers.	CAR, VAL	Economic benefits, such as encourage local and regional providers. Green jobs. Environmental benefits to air pollution.
CFT	19	University courses, leverage for further R&D, increased visibility thanks to new scientific publications	Municipalities, City Council and city administration; National and regional governments; Environmental associations; Academic organizations; Institutional Research Organizations; Financial institutions; EU projects; NGOs; International, Regional and Multilateral Organization	In partnership with academic institutions and partner organizations	Tbd	Tbd	Solar powered continuous accurate monitoring for air quality (NO2 and PM) and possible other parameters.



CFT	20	Local Authorities, Universities and commercial outlets where public engagement is sought or where environmental/social wellbeing promotion is planned	Municipalities, City Council and city administration; environmental organizations, academic institutions, and commercial outlets where public engagement is sought or where environmental/social wellbeing promotion is being promoted	In partnership with academic institutions and partner organizations	Tbd	Tbd	People engaged, awareness raised, project promotion.
CFT	21	University courses, leverage for further R&D, increased visibility thanks to new scientific publications	Municipalities, City Council and city administration; National and regional governments; Environmental associations; Academic organizations; EU projects; NGOs; International, Regional and Multilateral Organization	In partnership with academic institutions and partner organizations; with industry experts	Tbd	Tbd	Flood water slowed; flood water cleaned; biodiversity, local aesthetics.
CFT	22	University courses, leverage for further R&D, increased visibility thanks to new scientific publications	Municipalities, City Council and city administration; National and regional governments; Environmental associations; Academic organizations; Institutional Research Organizations; Financial institutions; Eu projects; NGOs; International, Regional and Multilateral Organization	In partnership with academic institutions and partner organizations; with industry experts	Tbd	Tbd	Flood water management.



LIV	23	To promote biodiversity in urban areas	For use in street scenes with local authorities, commercial areas, Business improvement districts and private landowners.	In partnership with commercial manufacturers.	Tbd	Tbd	Pollinator improvements, biodiversity.
LIV	24	To improve water quality and increase biodiversity	Municipalities, city council and city administration, environmental associations, academic organizations, selected utility providers	In partnership with commercial manufacturers	Tbd	Tbd	Biodiversity enhancements; water quality improvements, community awareness and project promotion.
IZM	25	/	District Municipalities; Provincial Administration, City services companies, Chamber of Commerce, Development Agencies, NGOs	Assistance and informing professional staff from administration and public, private sector and NGOs	Administration contracts and funded programs	IZM, IZT, EGE	Provision and share of technical knowledge and assistance to related public-private bodies & NGOs.
IZM	26		Municipal Organizations, City services companies, NGOs	Assistance and informing professionals from interested parties such as municipal organizations and NGOs	City-wide networks and initiatives	IZM, DEM, IZT, EGE	Provision and share of technical knowledge and assistance to related public-private bodies & NGOs.
IZM	27	Peynircioğlu River restoration as a first comprehensive demonstration project of NBS in Turkey may have the great potential to attract various public and private institutions. Therefore, by using city-wide networks and associations the results will be delivered.	Municipal Organizations, City services companies, NGOs	Assistance and informing professionals from interested parties such as municipal organizations and private firms from the construction industry and architectural/landscape design firms.	City-wide networks and initiatives	IZM, EGE, BIT, DEM	Provision and share of technical knowledge and assistance to related public-private bodies & NGOs.



EGE	28	/	Researchers interested in ecosystem services, NBS in cities, NGO's and city dwellers interested in the project results	/	/	EGE	Share of scientific knowledge and results to related researchers and public-private bodies, NGOs & city dwellers.
EGE	29	/	Researchers interested in SWM, NBS in cities, NGOs and city dwellers interested in the project results	/	/	EGE, IZM	Share of scientific knowledge and results to related researchers and public-private bodies, NGOs & city dwellers.
LEI	30	LEITAT technical knowledge and acquired results will be used in different market initiatives with the aim to collaborate with companies that use bio electrochemical systems and want to use the produced electricity in powering sensors. This market initiative will have the objective to standardize the technology and place it in the market by its implementation in real environments. The exploitation routes of LEITAT's technological developments are through licensing the technology; offering R+D services and/or creating partnerships with industrial partners to launch the technology.	Industry and SMEs; Environmental associations;	Partnerships and/or other agreements with other stakeholders; Activities carried out by an existing unit within existing organization.	Sales channels	Water and wastewater treatment companies; Environmental organizations; City councils and municipalities; City services companies	The Energy Harvesting System is designed to use the low voltage provided by the Electrowetland (> 0.5V) to power commercial devices such as environmental sensors and record the data that sensors provide to a microSD card.



LUD	31	It will be mainly used within the City of Ludwigsburg as a working paper	Municipality of Ludwigsburg	The Department of Climate and Energy Affairs will promote the Renaturing Urban Plan within the Municipality of Ludwigsburg.	Meetings and Mails and personnel Contacts	Several other departments in the City	Guideline for possible implementation of NBS in Ludwigsburg.
SGR	32	/	Municipalities, City Council and city administration.	Own management.	Website, social media, public tendering.	/	/
SGR	33	Commercialization of Urban Biofilter.	Municipalities, City Council and city administration. Environmental Association	Own management, partnership.	Website, social media, public tendering.	/	Purifies the air, contributes to reduction of heat wave effect, reactivates public spaces.
SGR	34	To be shared in the website	Municipalities, City Council National and regional governments, City services companies, Utility providers, Local communities, Urban Planners, Environmental associations, Academic organizations, Institutional Research Organizations Industrial Research, Organizations, Industry and SMEs, Standardization bodies, Financial institutions, EC, EU projects EU institutions, NGOs, Multilateral Organization.	/	Web	/	The target of this document is the definition of a catalogue that include all the possible characteristics (technical, economic, environmental, and social) of each one of the NBSs; in order to be able to select the best options to introduce them in the development of a Renaturing Urban Plan (RUP).
CAR	35	/	/	/	/	/	/
VAL	36	/	/	/	/	/	/
VAL	37	Increased tourism. VALLADOLID Letters might be the representative image of the city	Citizens	Own management: Valladolid City Council	Tourism, social networks, postcards	SGR, VAL	Increase of the tourism, economic benefits. Green jobs.



CFT	38	/	/	/	/	/	/
CFT	39	University courses, leverage for further R&D, increased visibility thanks to new scientific publications	Municipalities; National and regional governments; Env. Ass.; Academic organizations; Institutional Research Organizations; Financial institutions; EU projects; NGOs; International Organization	Own management	Tbd	Tbd	Visual communication /illustration of proposals.
RMI	40	The guide can be shared	Municipalities, City Council and city administration, National and regional governments, City services companies, Utility providers, Local communities, Urban Planners, Environmental associations, EU projects, EU institutions, NGOs	Guide/tools for implementers, planner, municipality, organizations, local communities,	Urban planning, NBS implementation bodies, local certification or evaluation department, city and community administration	/	/
GMV	41	Replicate the knowledge produce to other cities	City Council, National and regional governments City services companies Utility providers, Urban Planners, Env. Ass., Academic organizations, Research Organizations, Industrial Research Organizations, Industry and SMEs, Standardization bodies, EC, EU projects, EU institutions, International Organization	Tbd	Tbd	Tbd	/



CEN	42	Commercial purpose is mainly considered in this exploitable result providing this service to stakeholders	Municipalities; Regional governments; City services companies; Urban Planners; Env. Ass.	Delivery of technical assistance	Administration contracts and funded programs	City CAR; LEI; ACC; SGR	Provision of technical knowledge and assistance to public bodies.
MAN	43	/	/	/	/	/	/
GMV	44	Replicate the knowledge produce to other cities	Municipalities, National and regional governments, City services companies, Utility providers, Urban Planners, Env. Ass., Universities, Research Organizations, Industrial Research Organizations, Industry and SMEs, Standardization bodies, Financial institutions, EC, EU projects and institutions, International Organization	Tbd	Tbd	Tbd	/
RMI	45	Replication in other cities	City administration, Local communities, Urban Planners	Activities carried out by an existing unit within existing organization	Academic programs; Participation in other projects	City CAR; LEI; ACC; SGR	Add-on benefits, providing technical knowledge and assistance to public bodies.



UBO	46	Scientific publications, application of the methodology in other cities, application of the methodology in other EU projects, develop an integrated evidence base and a European reference framework on NBS	Municipalities, City services companies, Utility providers, Urban Planners, Env. Ass., Universities, Institutional Research Organizations, Industrial Research, Organizations, Industry and SMEs, Standardization bodies, Financial institutions, EC, EU projects, EU institutions, NGOs, International Organization	N.A.	Conferences Participation at call for papers University website On-line platforms Webinars UGUP website Task force on governance and business models for NBS	/	Improvement of knowledge development of new contacts with partner research institutes universities. Application of the methodology in other projects Consultancy to private and public bodies University courses.
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IFO	47	<p>Leveraging on its existing approach, IFO is working on an integrated approach to measure the impact of all C&D activities of a project. The methodology will be applied to other projects, research areas, communication campaigns</p> <p>Fondazione ICONS is running. Aim of the approach is not only to monitor data but also to use it as a "control" tool to identify formats, channels, style, etc. which work and don't work and take corrective actions, so to improve the overall D&C impact. Moreover, IFO maintains a database with all monitoring data from all the project, the partner runs (including closed projects, for the past 10 years). This will allow to compare data across projects and to identify areas of improvements. The methodology will therefore strengthen IFO commitment to keep on improving its C&D services and impact in EU projects.</p>	EU R&I projects	<p>IFO manages the result and is the main contact point for any type of information. A team dedicated to data collection has been formed within Fondazione ICONS, which is also evaluating a software solution to speed up data collection (custom application development to be contracted as none of the available solutions on the market -already tested-comply with the requirements of C&D in EU projects, rather provide dashboards for marketing campaigns in the commercial area).</p>	<p>IFO existing EU projects, IFO existing contacts in the EU project area. An article is under evaluation.</p>	<p>Partners working in projects are requested to collaborate, providing some data inputs to IFO. This allows the model to become really comprehensive (covering not only the data IFO collects centrally, but also selected partners' data).</p>	<p>Provides impact of projects' C&D activities. Allows to analyze different areas independently (social vs website vs publications vs webinars, etc.), but also in an integrated manner (CEI). Allows learning from data and taking corrective actions to maximize C&D impacts.</p>
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IFO	48	After the first experience with URBAN GreenUP, IFO has already exploited this methodology to develop C&D Plans for EU new smart cities' projects	EU-funded projects	IFO collects information and co-design the strategy with the involved local contact points for each city	IFO existing EU projects	Local contacts at city and pilot site level are highly involved in the development of the local C&D Plan	A customized approach to C&D is fundamental to adapt the strategy to the local social context and maximize impacts in terms of awareness and acceptance. There is no recipe that fits for all, especially where different social and cultural contexts are involved. A top-down and only EU-based approach to communication is less effective and runs the risk of not reaching the expected impacts
MAN	49	/	/	/	/	/	/
MAN	50	/	/	/	/	/	/
GMV	51	Replicate the knowledge produce to other cities	City Council, National and regional governments, City services companies, Utility providers, Urban Planners; Environmental associations; Academic organizations; Institutional Research; Organizations, Industrial Research Organizations Industry and SMEs, Standardization bodies, Financial institutions, EC, EU projects, European institutions and agencies, International, Regional and Multilateral Organization	Tbd	Tbd	Tbd	/



RMI	52	Application to add on to the NBS service	<ul style="list-style-type: none"> - City administration - National and regional governments - Local communities -Urban Planners 	Activities carried out by an existing unit within existing organization	Academic programs in universities; Participation in other projects	City, CAR, LEI; ACC	Add-on benefits, providing technical knowledge and assistance to public bodies
UBO	53	Scientific publications, improvement of knowledge, application of the methodology in other projects, consultancy to private and public bodies University courses, develop a policy framework to foster implementation of NBS	<ul style="list-style-type: none"> Municipalities, City Council and city administration, City services companies; Utility providers, Environmental associations; Academic organizations; Institutional Research Organizations, Industrial Research Organizations; Industry and SMEs, Standardization bodies; Financial institutions, EC, EU projects, EU institutions, International Organization 	N.A.	<ul style="list-style-type: none"> Conferences; Participation at call for papers; University website; On-line platforms; Webinars; UGUP website; Task force on governance and business models for NBS 	/	Decision making optimization; Development of new market instruments



UBO	54	Scientific publications, improvement of knowledge, application of the methodology in other projects, consultancy to private and public bodies, University courses, develop a policy framework to foster implementation of NBS	Municipalities, City Council and city administration, City services companies; Utility providers, Environmental associations; Academic organizations; Institutional Research; Organizations, Industrial Research Organizations, Industry and SMEs, Standardization bodies, Financial institutions, EC, EU projects, EU institutions, International Organization	N.A.	Conferences; Participation at call for papers; University website; On-line platforms; Webinars; UGUP website; Task force on governance and business models for NBS	/	Decision making optimization; Development of new market instruments
CFT	55	University courses, leverage for further R&D, increased visibility thanks to new scientific publications	Municipalities, City Council and city administration; National and regional governments; Env. Ass.; Academic organizations; Institutional Research Organizations; Financial institutions; EU projects; NGOs; International Organization	In partnership with academic institutions and partner organizations	Tbd	Tbd	Economic benefits of proposed and existing NBS
RMI	56	Applying in other city in support of city green development	Cities, Local communities, Urban Planners	Activities carried out by an existing unit within existing organization	Academic programs, Participation in other projects	City, CAR, LEI; ACC	Add-on benefits, providing technical knowledge and assistance to public bodies



CFT	57	University courses, leverage for further R&D, increased visibility thanks to new scientific publications	Municipalities, City Council and city administration; National and regional governments; Environmental associations; Academic organizations; Institutional Research Organizations; Financial institutions; EU projects; NGOs; International Organization	In partnership with academic institutions and partner organizations	Tbd	Tbd	Identification and prioritization of areas for NBS implementation; intelligence led approach to GI introduction
GMV	58	N/A	City Council, National and regional governments City services companies Utility providers, Urban Planners, Env. Ass., Academic organizations, Institutional Research Organizations Industrial Research, Organizations, Industry and SMEs, Standardization bodies, Financial institutions, EC, EU projects EU institutions, International Organization	Tbd	Tbd	Tbd	/



UBO	59	Understanding the functioning markets for NBS. Improvement of knowledge interaction with non-European markets. Improvement of knowledge Application of the methodology in other projects. Consultancy to private and public bodies University courses, Paper publication, develop a policy framework to foster implementation of NBS. Develop an integrated evidence base framework on NBS	Municipalities, City Council and city administration; City services companies; Utility providers; Urban Planners; Environmental associations; Academic organizations; Institutional Research Organizations; Students and Trainees; Industrial Research Organizations; Industry and SMEs; Standardization bodies; Financial institutions; EC, EU projects European institutions and agencies, NGOs, International Organization	N.A.	Conferences; Participation at call for papers; University website; On-line platforms; Webinars; UGUP website; Task force on governance and business models for NBS	/	Creation of new markets. Decision making optimization. Development of new market instruments
IFO	60	Enable third party exploitation, uptake and replication of URBAN GreenUP practices and recommendations	Cities, urban planners, policy makers, researchers	IFO will coordinate the collection of lessons learnt and recommendations from the partners and transform them into customized contents	Distribution via the project's website, social media, events	All	An easy-to-read guide providing useful insights for replication of best practices, with the inclusion of advices and cautions for NBS upscaling



IFO	61	<p>The knowledge collected and processed in different formats for dissemination purposes as well as the open dialogue and engagement with new stakeholders will increase IFO's and other project beneficiary's knowledge background and enlarge their network and communities that can be activated for new projects and partnerships or for research purposes. IFO will reinforce its reputation as a major content provider and distributor for both the general public via the media (online and TV) and for targeted audiences with a more customized approach. Events and communication campaigns will enable IFO to broaden its network of contacts for new cooperation opportunities.</p>	Stakeholders at large	<p>IFO will coordinate the collection of knowledge and major outcomes from the partners and translate them into the language of the different target audiences, based on their values and benefits, through the most accessible formats</p>	Web, TV	All	<p>Tailored C&D insights and approach in smart city and NBS contexts able to create and animate large communities of stakeholders</p>
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BIN	62	Use for purposes: research	Municipalities, City Council and city administration; City services companies; - Citizens - Local communities - Urban Planners; - Environmental associations; - Academic organizations; - Students and Trainees; - Industry and SMEs; - EU projects; - NGOs	Agree to the broadcasting schedule of the results achieved with the local Broadcasting Station and the Newsroom	Binh Dinh Radio and Television; Binh Dinh newspaper	NGOs; International, Regional and Multilateral Organization	The community is conscious of protecting and developing local green infrastructure
CEN	63	The main purposes of CENTA, as public foundation and technology center, are: research, scientific, political. In this case, the exploitation possibilities consider, including for example commercialization of products, launch of services such as technical assistance, leverage for further R&D, increased visibility thanks to new scientific publications, and use in training courses lead by CENTA.	Academic organizations; Institutional Research Organizations; Students and Trainees; Industrial Research Organizations; Standardization bodies; EC; EU projects	Development of scientific articles, PhD programs and publications in relevant issues that can be coordinated in coordination with other stakeholders, such as public/private institutions, research centers or universities.	Scientific issues; Academic programs in universities; Participation in other projects	Academic organizations; Research and Technological centers. CARTIF; LEITAT; ACCIONA; CITIES; UNIVERSITIES; SINGULAR GREEN	Share of knowledge and R&D activities can led into new partnerships between stakeholders, development of enhanced designs of NBS and interactions within public bodies



LEI	64	The knowledge acquired during the URBAN GreenUP project will be use as the base to participate in other national and international projects, wastewater treatment, cities, etc. Also, articles publication, training courses are part of the exploitation strategy of LEITAT	Environmental associations; Academic organizations; Institutional Research Organizations; Students and Trainees; Industrial Research Organizations; Industry and SMEs; EC; EU projects.	Activities carried out by an existing unit within existing organization; collaborations with other stakeholders	National and international project offices at LEITAT; R&D departments	Academic organizations; Research and Technological centers. Municipalities; city councils; Industry and SMEs	The knowledge acquired during the project validates the technology and consolidates the role of LEITAT as a technology and NBS expert.
MAN	65	/	/	/	/	/	/
MAN	66	/	/	/	/	/	/
MAN	67	/	/	/	/	/	/
MAN	68	/	/	/	/	/	/
VAL	69	Ideological changes. Political purposes.	Municipality, City Council and city administration; City services companies	Own management: Valladolid City Council (Innovation Area)	Internal meetings with different areas of the City Council	VAL	Ideological changes in the way of ordering a city, towards sustainability
IZT	70	As an academic partner, IZTECH's exploitation possibilities consider, for example, leverage for further R&D via its technology park ecosystem, technical assistance to interested organizations, increased visibility via scientific publications, and use in training courses lead by IZTECH's continuous education center.	Universities, Municipal and Provincial Public Administrations, R&D consultancy firms, NGOs	Introducing NBS to related PhD and MSc programs, training courses and relevant publications	Academic programs, training courses and participation in relevant projects & events	IZT, EGE, BIT	Share of knowledge and R&D activities may help to increase awareness in NBSs implementation that in turns new R&D projects with relevant public bodies



ACC	71	Mainly economic/commercial purposes, but also research and political.	Municipalities, National and regional governments, City services companies, Utility providers, Local communities, Urban Planners, Environmental associations, Academic organizations, Institutional Research organizations; Industrial Research organizations, Industry and SMEs, Standardization bodies, Financial institutions (banks, foundations, capital management bodies, large private investors, insurance companies), EC, EU projects; European institutions and agencies, NGOs, International, Regional and Multilateral Organization	Tbd	Tbd	Possibly CARTIF: update to the NBS catalogue, tool	Cities decarbonization Challenge support
CAR	72	The Excel-based app can be shared	Public administration	Service	Urban planning, policy making	CAR	



BARRIERS and risks		
Filled by	Result number	Barriers and Risks
VAL	1	/
VAL	2	Lanaland: Difficulties on finding wool sub products, the market can mistrust the solution (as the subtract is sheep wool waste).
VAL	3	This is a complex solution that might not work properly, once that it is implemented. Likewise, the maintenance might be hard or expensive. Final results after UGUP must be analyzed to determine the exploitable results and potential. The technical design is totally adapted to the specific location, so this cannot be replicated automatically.
VAL	4	Noise barriers do not necessarily need a green infrastructure to be effective, so this might be challenging for a real commercialization of the product (costs).
VAL	5	Green infrastructure is not cheap, either construction or maintenance.
VAL	6	/
VAL	7	Once the UGUP project ends, the prototype must be tested on an industrial scale.
VAL	8	Low performance (little electricity generated, water that cannot be treated, etc.).
MAN	9	/
MAN	10	/
SGR	11	Citizens awareness of water consumption and public funds spending.
SGR	12	/
LEI	13	The innovative character of the technology can be a barrier for the wastewater treatment companies to accept its implementation at real scale. The integration of natural wastewater treatment systems in urban environments can have administrative and social barriers related to public health or fears to odors or mosquitos. These barriers can be solved by delimiting the area and applying protective measures.
BIN	14	Restoring mangrove ecosystems takes time, resources, funding, and the consensus of all levels of government and communities.
CAR	15	Budget
CAR	16	Budget
VAL	17	Injecting water into the subsoil and collecting water for reuse require permits from the River Duero Authority (legal framework, from the Water Directive).



VAL	18	Difficulties in monitoring the solution (removal of air pollution), as there will not be installed specific sensors for measuring air quality before and after the soil deployment.
CFT	19	Need agreement to host sensors on street infrastructure; ongoing data costs; need robust comparison data with existing Government recognized data recording methods to promote more widely.
CFT	20	Need storage location, security and be able to hire trees, etc. Needs to adapt with changing message to stay interesting and relevant.
CFT	21	Not suitable where there are lots of underground utilities; carriageway run off requires modelling to ensure sufficient water to trees; trees must be suitable for city environment and tolerant to local conditions inc factors such as de-icing products.
CFT	22	Need to collect sufficient data for modelling and need baseline conditions to demonstrate improvement; Need to be able to extrapolate and apply to other similar proposed systems to demonstrate potential value.
LIV	23	Regular watering/plant maintenance is required; street furniture needs to withstand additional loading.
LIV	24	Permissions from water body owners/users and agreements may be required; ongoing maintenance agreements needed; safety water risk if too accessible to members of the public; could be colonized by larger species who eat/destroy the vegetation with loss of ecosystem value.
IZM	25	Lack of interest by interested parties due to low awareness level regarding to NBS.
IZM	26	There could be budget-cuts to more urgent city-services (i.e. COVID19 measures).
IZM	27	Lack of interest by interested parties due to low awareness level regarding to NBS.
EGE	28	Time delays may occur in publishing the articles/researches due to unforeseeable issues in monitoring process.
EGE	29	Time delays may occur in publishing the articles/researches due to unforeseeable issues in monitoring process.
LEI	30	The innovative character of the technology can be a barrier for companies to accept its implementation at real scale. The low amount of energy produced can limit the range of application and the economic profitability.
LUD	31	Lack of interest on other Departments of the City; no money to implement NBS in the Plan.
SGR	32	/
SGR	33	Citizens awareness of water consumption and public funds spending.
SGR	34	/
CAR	35	/
VAL	36	/
VAL	37	/
CFT	38	/



CFT	39	IT product but easy to use; currently license held and administered by CFT.
RMI	40	Identifying the suitable stakeholders and Ensuring the continuity in the involvement of stakeholder. Be able to involve the right stakeholders and get the right feedback in the co-creation process for NBS implementation.
GMV	41	Many different partners and different entities involved, only linked by the project. Different commercial approach.
CEN	42	From the administration, lack of investment in NBS and poor knowledge of technicians can affect the implementation of these solutions.
MAN	43	/
GMV	44	Many different partners and different entities involved, only linked by the project. Different commercial approach.
RMI	45	Renature plan developed to supplement the general planning process and guide the green development of the city, thus a lack of awareness and integration of the renature urban plan within the city general planning process is the barrier.
UBO	46	Data availability; Lack of impacts monitoring; Capacity building.
IFO	47	Data collection is time consuming considering different sources and formats (need for a dedicated software tool). Some data depend on partners (partners' commitment).
IFO	48	Cities are requested to cooperate. They have to consider that time, resources and skills dedicated to communication and dissemination are necessary to develop the most effective strategy.
MAN	49	/
MAN	50	/
GMV	51	None
RMI	52	Lack of clear technical, institutional capacity at the city will hinder the application of the replication potential analysis.
UBO	53	Data availability; Lack of interest in NBS implementation.
UBO	54	Data availability; Lack of interest in NBS implementation.
CFT	55	IT software training may be required; needs updating to stay relevant; needs to be incorporated into decision making processes.
RMI	56	The characterization process serves to holistically understand the needs, the capacity and the applicability of the NBS concept to the city environment. A clearer characterization will better serve the city green development. Risk related with the characterization maybe at some points where the process may emphasize more on particular NBS application.



CFT	57	Need mapping IT or understanding; Need sufficient GIS mapping data; Need to have methodology recognized and used by decision makers.
GMV	58	None
UBO	59	Data availability.
IFO	60	N.A.
IFO	61	D&C requires investments; Local strategies require local actors; Different urban context may require further personalization of approach and content.
BIN	62	Conflicts of personal interest may lead to disagreements in the protection and development of local green infrastructure.
CEN	63	Non-significant results in terms of research or lack of ideas can suppose a severe barrier.
LEI	64	No significant barriers are detected.
MAN	65	/
MAN	66	/
MAN	67	/
MAN	68	/
VAL	69	Barriers to habit and cultural changes.
IZT	70	Less access to research results due to lack of awareness.
ACC	71	Extreme confidentiality, lack of continuity.
CAR	72	Usability



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