

# EU-CONEXUS RESEARCH FOR SOCIETY

D. 4.2

"External services implementation"

2023

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## Introduction

The European University for Smart Urban Coastal Sustainability - EU-CONEXUS promotes common European values and strengthens European identity by bringing together a new generation of Europeans, who can cooperate and work within different European cultures, in different languages and across borders, sectors and academic disciplines. EU-CONEXUS is committed to creating a new institutional framework for higher education in Europe that allows for a truly European way of studying and carrying out research through institutional alignment and seamless mobility for all. The thematic framework Smart Urban Coastal Sustainability (SmUCS) means for EU-CONEXUS to focus its research & innovation, education and knowledge-sharing activities on societal challenges that are linked to a specific geographical location – the urban and semi-urbanised coastal (rivers and oceans) regions. SmUCS is a challenge-driven education and research domain. The EU-CONEXUS RESEARCH FOR SOCIETY (RFS) project, funded by the European Commission to support higher education institutions in Europe and their institutional transformation, aims at the modernisation and internationalisation of the Research & Innovation dimensions of the European University for Smart Urban Coastal Sustainability.

Among the EU-CONEXUS-RFS partners, 5 out of 6 institutions in total, are in capacity to provide external services.

The 5 partners are:

1. La Rochelle Université (FR),
2. Agricultural University of Athens (EL),
3. Technical University of Civil Engineering Bucharest (RO),
4. Klaipeda University (LT),
5. Catholic University of Valencia (ES),
6. University of Zadar (HR) (not participating in this task)

Every partner offers external services except for the University of Zadar, which cannot currently provide but is taking the necessary actions to provide external services as soon as possible. In addition, one EU-CONEXUS partner, Frederick University (CY), which is not involved in the RFS project, showed an interest in joining the activity of external service provision by giving institutional prices to the external services that are interested to offer through the Alliance.

Task 4.2: External services implementation in the context of WP4 Research Infrastructure and Resources, aims to contribute to the sustainability of the European University – EU-CONEXUS

– by offering external services from the university to the industry, public bodies, SMEs. A cost estimation for every analysis to be offered was conducted in order to ensure competitiveness on the market. Market needs can be met by many of the specialised external services. However, in some cases, the novel external services offered by EU-CONEXUS laboratories and respective research infrastructures (EU-CONEXUS RI) can be used to develop new products and create novel market applications and opportunities, where there is no current existing market or which can be rarely found in national markets. In this case the external service is considered unique and an equivalent market price cannot be found.

## Purpose

The purpose of the Deliverable External Services Implementation is to join forces among partner universities and gather all the available external services to be promoted in the Innovation Hub which is linked to RIIS and to make industry and stakeholders aware of the services provided by EU-CONEXUS. In order to achieve the sustainability of the external services, a cost estimation for every analysis was performed in order to analyse the competitiveness of EU-CONEXUS services compared to market prices.

Additionally, a key objective of the price benchmarking is also to collect EU-CONEXUS-RFS external services and to make it easier to share them with researchers of the Alliance when they need an external service or expertise available in other EU-CONEXUS partner institutions. Some of our unique external services demonstrate the innovative character of the research that is developed within our universities.

In other words, external services implementation is a pilot incentive for enhancing cooperation, training researchers and managers, making the industry more aware of the services provided by EU-CONEXUS as well as fostering the embeddedness of EU-CONEXUS in local, regional, national, European and global Research & Innovation ecosystems and industrial value chains.

## Definition

“Services” are defined as specialized activities concerned with research and experimental development and contributing to the generation, dissemination and application of scientific and technical (S&T) knowledge.

“Sample analysis” defines/ refers to the chemical process used to determine the presence of certain substances, legal or illegal, in a specific sample of hair, saliva, urine, or fingernail clippings.

“EU-CONEXUS RI” defines the Research Infrastructures of EU-CONEXUS partners.

Categorization of the external services has been done into Categories & Sub-categories:

Category	Sub-category
Field testing	Geological, Physio Chemical, Biodiversity, Environmental monitoring
Lab testing	Physio Chemical, Instrumental, Microbiological, Molecular, Sensorial
Breeding/ Cultivation	Microorganisms, Plants, Invertebrates, Vertebrates
Consulting	Environmental impact studies, Feasibility studies, Monitoring, Verification of procedures, Accreditation and reaccreditation, Detection of deficiencies and resolution, Mapping
Engineering	Civil (Structural) Engineering, Hydraulic & Wind Engineering, Geotechnical Engineering, Construction Material Science, Building Services – Building Physics – Thermal Sciences, Geodesy, Environmental Engineering, Mechanical Engineering, Electrical Engineering and Lighting, Mathematics and Computer Science
Education & dissemination	Workshops, Tailored trainings, Conferences, Symposiums, Exhibition materials
Medical care & clinical research	Clinical speciality
Other	

## Description of the preparatory work

In the framework of task 4.2 External Services Implementation, the work initiated right from the project's outset and the working group engaged collectively in gathering information for the needs of the task. In more detail, in order to develop the external services provision, taking into account the mapping of EU-CONEXUS research infrastructures (RI) (T.4.1) and the common access policy (T.4.3), every partner identified at least 3 companies (public or private) offering similar external services on the respective national level. This step was necessary to assess each cost estimation of an external service/analysis based on the market price. Stepping forward, every partner investigated institutionally which analysis/ external services can be provided and promoted via the EU-CONEXUS Innovation Hub, linked to EU-CONEXUS Research & Innovation Information System (RIIS) and EU-CONEXUS website. This investigation had different formats. The Task Leader shared a template of the External Services Call with all partners. Dissemination was performed in various ways: in some institutions the External Services Call for interest was shared via e-mail, in others, there was direct contact with via telephone or physical meeting was applied or both. The External Services Call remained open by the end of the project in order to attract as many Research Units as possible to be incorporated into the action. During Work Package 4 meetings, every partner presented institutional feedback and the progress of the available external services.

All partner universities offered external services through EU-CONEXUS channels, with the exception of the University of Zadar, which, at the moment, cannot offer external services but is planning to do so in the future. The University of Zadar currently focuses on social sciences and humanities and does not offer commercial services to the market. Minimal activities are carried out in a laboratory that regularly analyses wine and oil samples, but these are limited and insufficient to survive on the market. Furthermore, the legal framework in the Republic of Croatia still does not allow for complete, simple and predefined price lists for the services offered by scientific institutions. However, the University is systematically working on strengthening its capacities, both in the acquisition of relevant systems that will contribute in various areas (EEG system, laboratory equipment for mussel farming, GIS systems for field studies, etc.). At the same time, the construction of various facilities is planned, which should make it possible to consolidate the system in the near future and then operate it commercially outside the local environment. When the University develops services that can be offered on the market, those will systematically be included in the range of services offered by all Alliance partners.

Once the institutional interest for external services was collected, they were divided into categories & sub-categories. Every partner added the average market cost per external service together with the estimated institutional cost. In that way, the price benchmarking, among university prices and market prices was developed, comparing both costs. However, in some cases of external services provision, no corresponding market unit cost was available, especially for some research-based and consultancy services, that can be provided upon request. In addition, partner Universities agreed to leave the External Services Call open in order to give the opportunity to more Research Unit to collaborate in incorporate their external services into RIIS.

When available, an institutional link (web URL) to the external service was also added by each partner university, whether it was in English or in the respective native language. The institutional link has a brief description of the services, a relevant picture, a time framework to deliver the analysis/ service and a contact person. The price is not always displayed since it is something dynamic, differentiate per country and it is a common practice to be offered after demand.

During the hybrid meeting in Athens, on the 28<sup>th</sup> & 29<sup>th</sup> of September 2023, the members of the Research Infrastructures Working Group discussed the Deliverable's structure, made comments and additions in order to create the final version of the Deliverable while the price benchmarking depiction was discussed in order to be incorporated in the Deliverable as Annex.

## **Promotion of the external services**

The external services offer for industry, SMEs, public bodies are being promoted by using the interface created in WP5, Innovation Hub (<https://innovationhub.eu-conexus.eu/>). The Innovation Hub website is an interactive platform providing “information and services related to innovation and commercialisation”, aiming to “facilitate communication between the economic environment and the research, field, like a social space where investors, entrepreneurs and researchers can identify opportunities” and initiate collaborations with EU-CONEXUS. In other words: “a solution for real-time interaction between different players within the innovation ecosystem, a “one-stop-shop for business representatives looking for ready-made innovative products and a partnering tool for industry searching for partners”. The Innovation Hub showcases innovative research projects or outputs from the Alliance that have different maturity levels (research, prototype, market stage), some developed solely within partners' research units, others developer in partners' research units in collaboration with external socio-economic partners like companies or local authorities.



Additionally, all available external services of the consortium are listed in the Research and Innovation Information System – RIIS – (WP1) available at the URL <https://riis.eu-conexus.eu/>. Several meetings took place among the representatives of WP4, WP3 and IT representatives to define the RIIS structure. The RIIS website presents a directory of EU-CONEXUS researchers and research support staff, research units, facilities, equipment and services, aiming to showcase EU-CONEXUS scientific potential on Smart Urban Coastal Sustainability and to facilitate research collaborations within and outside the Alliance. As an outcome of the RIIS, matching partners' research organization, searchable lists of research facilities, equipment and services were created as well as links between these data. The data available in the RIIS were supplied by the heads of the respective Research Unit. Facilities, equipment and services from all partner Universities will continuously be updated in the future to maintain an up-to-date directory.

The data in the RIIS are targeted both to an internal EU-CONEXUS audience (researchers, academics, students) as well as to external users (business, industry, social partners, authorities etc.).

Finally, external services are also promoted through the institutional communication channels & EU-CONEXUS platforms.

## Price Benchmarking

The price benchmarking was based on the prices of the external services provided by each University compared to the respective market prices. The process of comparing prices led to a better understanding of our competitive positioning thus helped in adjusting the right institutional prices. Each university follows the internal institutional rules for the provision of external services. In addition, the external services provider from each institution, has the responsibility to update the prices when necessary.

All available services offered by EU-CONEXUS as well as financial data (market and institutional prices) were collected and are presented in Annex I-VI. Each partner is represented in different Annexes. Tables in the Annexes include extended descriptions of the supplied external services regardless the availability of the market price. Tailor-made unique services that are offered upon demand are also included. A graphical chart was created per category of external service and per university, showing the divergence between the institutional and the market price. It has to be noted that, only external services that have both market and institutional prices could be included in the graph. This analysis was performed for internal use in order to facilitate the adjustments of

the institutional prices and enhance their competitiveness as well as to harmonize them with market prices in order to facilitate joint activities and serve clients from different universities of the consortium. The prices remain confidential as both market and institutional prices can easily change and be influenced by many factors per country.

The analysis shows the majority of the institutional prices offered are lower than the market prices. There are few exceptions where the institutional prices are higher than the market prices, however the percentage of price difference is very low.

A key objective of the price benchmarking is also to collect EU-CONEXUS-RFS external services and to make it easier to share them with researchers of the Alliance when they need an external service or expertise available in other EU-CONEXUS partner institutions. Furthermore, unique external services demonstrate the innovative character of the research that is developed within universities. Our research-based services can be designed to have a holistic approach, including several, different types of analyses in a single study. Universities' excellence in research & innovation is supported by state-of-the-art infrastructures and in many cases by accredited laboratories. Accreditation of laboratories was specifically promoted in EU-CONEXUS during the Erasmus+ pilot project conducted in 2019-2022.

Regarding the use of external services for the internal needs of the consortium, it has been decided that special pricing upon agreement, will be offered for the Alliance partners thus supporting institutional alignment.

## **External Services Implementation Opportunities – Outcomes**

During the three-year progress of WP4 implementation, there has been an opportunity to record and estimate the consortium's potential to supply high quality external services giving added value to the EU-CONEXUS Alliance. Moreover, sharing infrastructures gives opportunities to create synergies among EU-CONEXUS researchers by providing external services in the 9 countries of EU-CONEXUS and beyond through a holistic approach. At the same time, the academic community of each partner has a better understanding of the European University mission and the several ways that anyone from the academic community belongs and can benefit from this initiative. The external services mapping let us join forces by facilitating collaboration among our universities.

Furthermore, by implementing the D4.4 Access policy roadmap in joint infrastructures and services for EU-CONEXUS Joint Research Infrastructures based on the "European Charter for

Access to Research Infrastructures”, compilation of services and special pricing agreements among partners’ research units can be achieved. In other words, access of EU-CONEXUS or external researchers to core facilities and equipment of Joint Research Infrastructures is facilitated and networking of research teams will be improved.

The development of the Research and Innovation Information System (RIIS) further aims to the broader dissemination of EU-CONEXUS – RFS activities and actions in the whole of Europe and beyond, promoting Alliance extroversion.

The newly developed external services structure offered to stakeholders can have substantial benefits for the consortium’s sustainability, leading to a way of creating funding from third parties that can be used to support research expenses (equipment, consumables) or human resources, as well as providing economies of scale by reducing additional investment cost for new equipment that is already available in partners’ facilities.

Another outcome is the interconnection with the industry and the other stakeholders as well as small scale production companies on national, European and international levels. The purpose is also the advancement of collaboration and of the commercial exploitation of consortium ‘s research facilities and infrastructures.

External services interconnection activities also pertain to continuous contact with Smart Urban Coastal Sustainability business sector in order to achieve cooperation contracts for the exploitation of research results and possibly the creation of entrepreneurial plans.

It is also a further opportunity to attract stakeholders and create new business cooperation agreements and contracts via external services provision. A long-lasting vision is that positive feedback from customers can lead to the establishment of consistent quality and delivery requirements and to predictable demands, indicating the services or actions to be maintained and the improvement to achieve in order to ensure higher competitiveness.

Through these services, it is easier to connect with businesses’ Research and Development offices whose needs could be fulfilled by EU-CONEXUS, utilizing various sources funding including the interested company.

Another substantial benefit is the ability to strengthen the bonds between EU-CONEXUS research community and the international business community in order to cultivate the connection between the university and the labor market which is crucial for the effectiveness of education offers of EU-

CONEXUS alliance. As a result, the success of individuals in their professional lives gives added value to our student community and alumni network.

## Conclusion

The goal of the Alliance constantly remains to increase the number of provided external services and promote its activities to the public. The communication platforms will be continuously updated with new external services from the researchers' community.

The task of joining forces in the field of external services has strengthen the networking within the Alliance by giving the opportunity to academic and research staff of partner universities to further promote their expertise via EU-CONEXUS, bringing higher interaction with the industry and the stakeholders.

Another main goal remains also to improve the consortium's external services, always sharing good practices innovation and quality, that is supported by the establishment of the common access policy.

This could also lead to the development of Technology Transfer Offices in Universities that do not exist at all partners by now and even to bilateral agreements/ Memorandum of Understanding (MoU) with stakeholders that are interested in connecting with the Alliance.

It is a strong belief that this practice will lead to extra benefits, not only for the sustainability of the consortium but also to new collaborations with stakeholders that will create job opportunities for our students, while helping us to respond to the labour market needs and address societal and market challenges. There will be better adjustment of academic offers to the market needs, study content closer to the market and design of the academic programmes with corresponding learning outcomes. This tool can help the structuration of joint research areas, to produce knowledge and promote sustainability/solidarity in Europe.

## ANNEX I – AUA external services price benchmarking

Table 1. Market and Institutional prices for services supplied by AUA

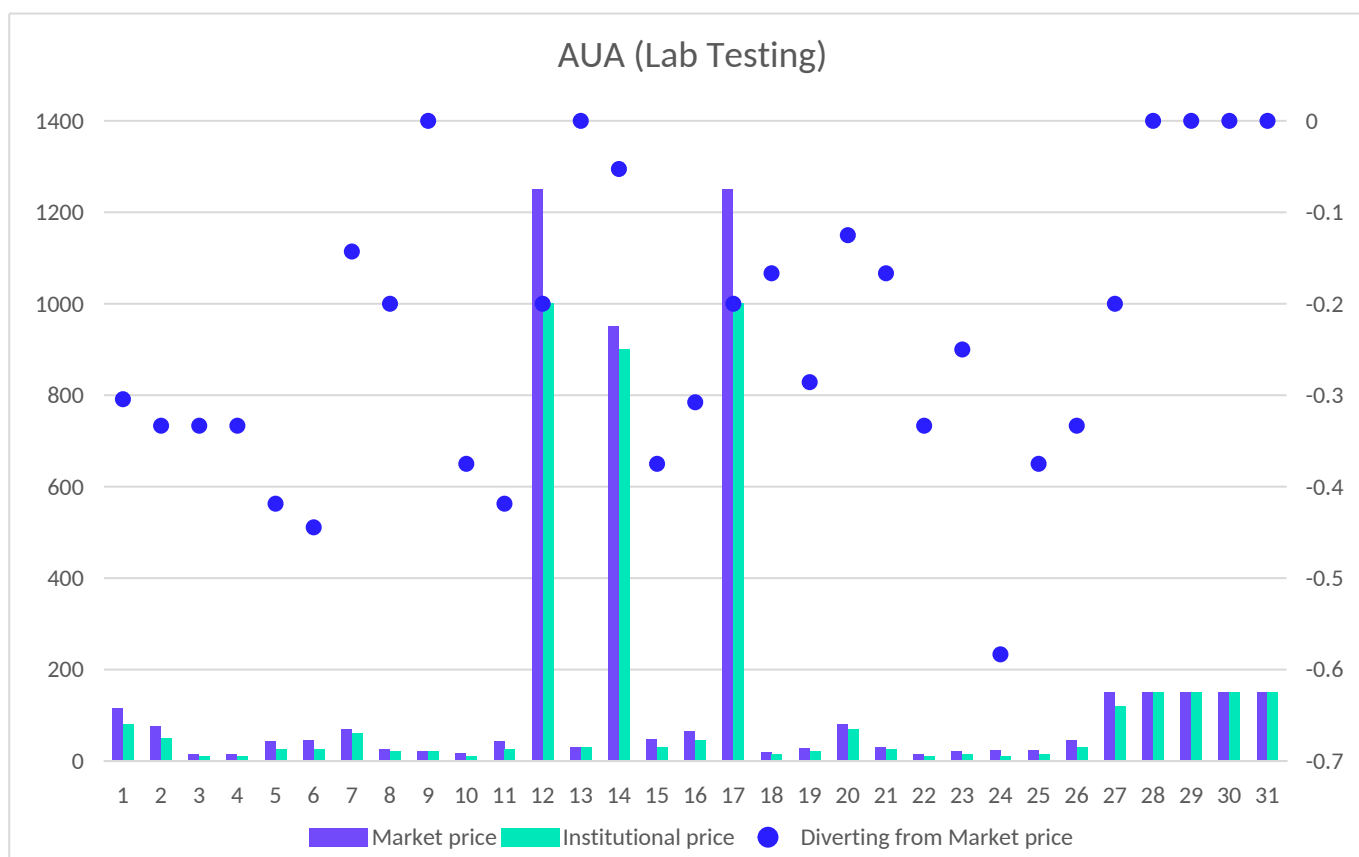
External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	Diverting from Market
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price						
1-AUA	Determination of groups of fatty acids (Saturated, Monounsaturated, Total Polyunsaturated, $\omega$ -3 Polyunsaturated, $\omega$ -6 Polyunsaturated)-including fat extraction	Laboratory of Applied Hydrobiology	Lab testing	115	80	-30%
2-AUA	Determination of groups of fatty acids (Saturated, Monounsaturated, Total Polyunsaturated, $\omega$ -3 Polyunsaturated, $\omega$ -6 Polyunsaturated) on fat sample	Laboratory of Applied Hydrobiology	Lab testing	75	50	-33%
3-AUA	Determination of Ash content	Laboratory of Applied Hydrobiology	Lab testing	15	10	-33%
4-AUA	Determination of moisture content	Laboratory of Applied Hydrobiology	Lab testing	15	10	-33%
5-AUA	Determination of fat content	Laboratory of Applied Hydrobiology	Lab testing	43	25	-42%
6-AUA	Determination of protein content	Laboratory of Applied Hydrobiology	Lab testing	45	25	-44%
7-AUA	Determination of Histamine	Laboratory of Applied Hydrobiology	Lab testing	70	60	-14%
8-AUA	Determination of Total Volatile Nitrogen (TVB-N)	Laboratory of Applied Hydrobiology	Lab testing	25	20	-20%
9-AUA	Determination of Phosphorous (P) content	Laboratory of Applied Hydrobiology	Lab testing	20	20	0%
10-AUA	Determination of pH in fish tissue	Laboratory of Applied Hydrobiology	Lab testing	16	10	-38%
11-AUA	RNA extraction	Laboratory of Applied Hydrobiology	Lab testing	43	25	-42%
12-AUA	Fish species identification (HRM Analysis-optimization)	Laboratory of Applied Hydrobiology	Lab testing	1250	1000	-20%
13-AUA	Fish species identification (HRM Analysis-only for selected species)	Laboratory of Applied Hydrobiology	Lab testing	30	30	0%

14-AUA	Gene expression/ Taqman assay qPCR optimization	Laboratory of Applied Hydrobiology	Lab testing	950	900	-5%
15-AUA	Gene expression (qPCR-Taqman)	Laboratory of Applied Hydrobiology	Lab testing	48	30	-38%
16-AUA	Gene expression (RT-qPCR-Taqman) price for 1 primer set	Laboratory of Applied Hydrobiology	Lab testing	65	45	-31%
17-AUA	Gene expression/SybrGreen qPCR optimization	Laboratory of Applied Hydrobiology	Lab testing	1250	1000	-20%
18-AUA	SybrGreen qPCR	Laboratory of Applied Hydrobiology	Lab testing	18	15	-17%
19-AUA	SybrGreen RT-qPCR	Laboratory of Applied Hydrobiology	Lab testing	28	20	-29%
20-AUA	Gene expression (ELISA)	Laboratory of Applied Hydrobiology	Lab testing	80	70	-13%
21-AUA	Water quality analyses (ammonia)	Laboratory of Applied Hydrobiology	Lab testing	30	25	-17%
22-AUA	Water quality analyses (nitrites)	Laboratory of Applied Hydrobiology	Lab testing	15	10	-33%
23-AUA	Water quality analyses (nitrates)	Laboratory of Applied Hydrobiology	Lab testing	20	15	-25%
24-AUA	Water quality analyses (orthophosphates)	Laboratory of Applied Hydrobiology	Lab testing	24	10	-58%
25-AUA	Water quality analyses (total P)	Laboratory of Applied Hydrobiology	Lab testing	24	15	-38%
26-AUA	Determination of chlorophyll content in water	Laboratory of Applied Hydrobiology	Lab testing	45	30	-33%
27-AUA	Fish pathology, diagnosis and treatment	Laboratory of Applied Hydrobiology	Lab testing	150	120	-20%
28-AUA	Aflatoxins	Laboratory of Phytopathology	Lab testing	150	150	0%
29-AUA	Fumonisin	Laboratory of Phytopathology	Lab testing	150	150	0%

30-AUA	Deoxynivalenol	Laboratory of Phytopathology	Lab testing	150	150	0%
31-AUA	Ochratoxins	Laboratory of Phytopathology	Lab testing	150	150	0%

**Table 2. AUA Graph - Comparison of Institutional and Market prices for the supplied External Services from AUA.** Market prices are indicted in purple and Institutional prices in mint green. The grey spots indicate the fluctuation of the percentage of price divergence for each services provided. The numbers of the horizontal axis refer to the respective list of services offered by AUA as shown in Annex I Table 1, category Lab Testing. The numbers of the left vertical axis refer to prices in euros and the numbers of the right vertical axis to the percentage of difference between Market and Institutional prices.



**Table 3. AUA external services without relevant Market prices**

External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)
Fish rearing for the estimation of growth factors and dietary impact	Laboratory of Applied Hydrobiology	Breeding/ Cultivation	N/A	tailor made, upon demand
Fish species identification (qPCR)	Laboratory of Applied Hydrobiology	Lab testing	N/A	tailor made, upon demand
DNA extraction	Laboratory of Applied Hydrobiology	Lab testing	N/A	15/ per sample



Fish species identification (DNA barcoding-Sanger sequencing)	Laboratory of Applied Hydrobiology	Lab testing	N/A	25/ per sample
Design and execution of randomized controlled clinical trials (i.e., Glycemic index of foods investigation, effects of consumption of functional foods and ingredients on indices of health, systematic reviews and meta-analyses, analyses of nutrient content, e.t.c.)	LABORATORY OF DIETETICS AND QUALITY OF LIFE	Medical care & clinical research & Other	1. Design and conduct of human clinical trials: 10000 - 250000 euro, 2. Literature Review: 10000 euro, 3. Epidemiological studies: 20000 - 300000 euro	Design and conduct of human clinical trials: 7000 - 220000, 2. Literature Review: 5000 - 8000 euro, 3. Epidemiological studies: 15000 - 280000 euro
Educational seminars (30h/ semester)- Webinars with topics regarding 1. Basic Principles of Human Nutrition, 2. Obesity epidemiology, management, and novel approaches, 3. Cardiometabolic risk in relation to diet and lifestyle, 4. Novel Technologies in Nutrition and Dietetics, 5. Nutritional Assessment and Support in Clinical Settings, 6. Counseling and Dietary Behavior Change	LABORATORY OF DIETETICS AND QUALITY OF LIFE	Education & dissemination	1000 euros per attendant per seminar for 30 ECTS education.	500 euros per attendant per seminar for training equal to 30 ECTS
Consultation for research and development of new food products, including literature review and scientific support and nutritional analyses	LABORATORY OF DIETETICS AND QUALITY OF LIFE	Medical care & clinical research & Other	1. Design and conduct of human clinical trials: 10000 - 250000 euro, 2. Literature Review: 10000 euro, 3. Epidemiological studies: 20000 - 300000 euro, 4. Development of new food products: 20000 - 100000, 5. nutritional analyses: 2000 - 20000, 6. Consultation in Food Companies or Individuals: 100 euro/hour	Design and conduct of human clinical trials: 7000 - 220000, 2. Literature Review: 5000 - 8000 euro, 3. Epidemiological studies: 15000 - 280000 euro, 4. Consultation on the development of new food products: 15000 - 900000, 5. nutritional analyses: 1800 - 18000 euro, 6. Consultation in Food Companies or Individuals: 80 euro/hour



## ANNEX II – UTCB external services price benchmarking

**Table 4. Market and Institutional prices for services supplied by UTCB (in euros)**

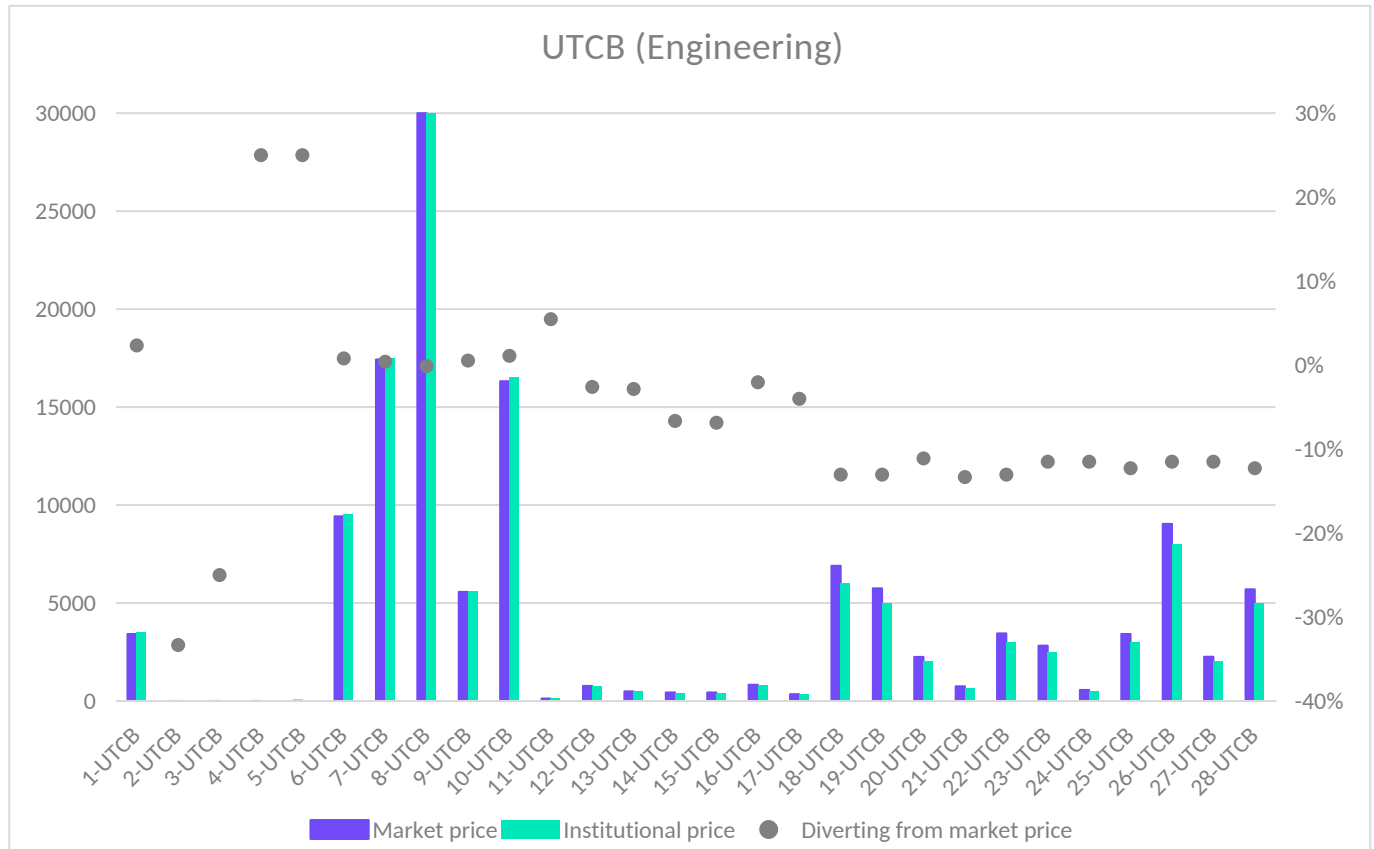
	External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	Diverting from market price	URL
1-UTC	Hydrodynamic tests, tracing tests, geophysical tests	Groundwater Engineering Research Center (CCIAS)	Engineering	3420	3500	2%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
2-UTC	Georadar Investigations for buried structures - linear meter of profile	Groundwater Engineering Research Center (CCIAS)	Engineering	3	2	-33%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
3-UTC	Geophysical investigations for electrical tomography - linear meter of profile	Groundwater Engineering Research Center (CCIAS)	Engineering	4	3	-25%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
4-UTC	Geophysical investigations for Seismic Refraction and MASW - linear meter of profile	Groundwater Engineering Research Center (CCIAS)	Engineering	4	5	25%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
5-UTC	Determination of heavy metal content in soil - XRF method - per sample	Groundwater Engineering Research Center (CCIAS)	Engineering	20	25	25%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
6-UTC	Delimitation of protection zones for groundwater abstraction - for 1 well study	Groundwater Engineering Research Center (CCIAS)	Engineering	9425	9500	1%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
7-UTC	Groundwater vulnerability analyses - for an area of 10 ha	Groundwater Engineering Research Center (CCIAS)	Engineering	17430	17500	0%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
8-UTC	Infrastructure - Aquifer interaction studies - for a City of 100.000 inhabitants	Groundwater Engineering Research Center (CCIAS)	Engineering	350400	350000	0%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>

9-UTCB	Dewatering studies	Groundwater Engineering Research Center (CCIAS)	Engineering	5570	5600	1%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
10-UTCB	Contaminated Site Investigation - for 1 ha	Groundwater Engineering Research Center (CCIAS)	Engineering	16320	16500	1%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
11-UTCB	Direct Push Drilling - per linar meter	Groundwater Engineering Research Center (CCIAS)	Engineering	128	135	5%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
12-UTCB	Hydraulic tests investigation - single pumping test	Groundwater Engineering Research Center (CCIAS)	Engineering	770	750	-3%	<a href="https://eemis.eu/ERIF-2000-000U-0366">https://eemis.eu/ERIF-2000-000U-0366</a>
13-UTCB	The investigation of the physical-chemical and mechanical properties of the construction products and of the mineral wastes for assessment of the valorization potential according to ecological, technical and economic limits	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	492	478	-3%	<a href="https://eemis.eu/ERIF-2000-000W-1654">https://eemis.eu/ERIF-2000-000W-1654</a>
14-UTCB	The research referring to assessment of the contaminants immobilization into binding matrix of the construction materials	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	436	407	-7%	<a href="https://eemis.eu/ERIF-2000-000W-1654">https://eemis.eu/ERIF-2000-000W-1654</a>
15-UTCB	The investigation and testing of the environmental properties by leaching tests as according to European Norms	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	437	407	-7%	<a href="https://eemis.eu/ERIF-2000-000W-1654">https://eemis.eu/ERIF-2000-000W-1654</a>
16-UTCB	The research on identification of the valorization	Mineral Waste Valorisation into Construction Materials	Engineering	831	814	-2%	<a href="https://eemis.eu/ERIF-2000-000W-1654">https://eemis.eu/ERIF-2000-000W-1654</a>

	potential of granular wastes as aggregates in mortars and concretes	Research Center (CC VADEMC)					
17-UTCB	The testing of the composite material properties required into construction applications	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	349	335	-4%	<a href="https://eeris.eu/ERIF-2000-000W-1654">https://eeris.eu/ERIF-2000-000W-1654</a>
18-UTCB	Studies of optimization and modernization of refrigeration equipment and systems	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	6900	6000	-13%	<a href="https://eeris.eu/ERIF-2000-000P-1822">https://eeris.eu/ERIF-2000-000P-1822</a>
19-UTCB	Studies for the optimization and modernization of thermal systems	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	5750	5000	-13%	<a href="https://eeris.eu/ERIF-2000-000P-1822">https://eeris.eu/ERIF-2000-000P-1822</a>
20-UTCB	Determining the thermal power for thermal equipment and systems	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	2250	2000	-11%	<a href="https://eeris.eu/ERIF-2000-000P-1822">https://eeris.eu/ERIF-2000-000P-1822</a>
21-UTCB	Tightness and pressure resistance tests for HVAC installations and thermal equipment	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	750	650	-13%	<a href="https://eeris.eu/ERIF-2000-000P-1822">https://eeris.eu/ERIF-2000-000P-1822</a>
22-UTCB	Chimney performance tests	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	3450	3000	-13%	<a href="https://eeris.eu/ERIF-2000-000P-1822">https://eeris.eu/ERIF-2000-000P-1822</a>
23-UTCB	Operational safety tests for boilers and radiation appliances	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	2825	2500	-12%	<a href="https://eeris.eu/ERIF-2000-000P-1822">https://eeris.eu/ERIF-2000-000P-1822</a>
24-UTCB	Determination of noise level in	Mineral Waste Valorisation into	Engineering	565	500	-12%	<a href="https://eeris.eu/ERIF-2000-000P-1822">https://eeris.eu/ERIF-2000-000P-1822</a>

	thermal and hydraulic equipment	Construction Materials Research Center (CC VADEMC)					
25-UTCB	Safety tests in the operation of thermal appliances	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	3420	3000	-12%	<a href="https://eemis.eu/ERIF-2000-000P-1822">https://eemis.eu/ERIF-2000-000P-1822</a>
26-UTCB	Determination of fire resistance for technical installations	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	9040	8000	-12%	<a href="https://eemis.eu/ERIF-2000-000P-1822">https://eemis.eu/ERIF-2000-000P-1822</a>
27-UTCB	Determination of fire resistance and smoke tightness	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	2260	2000	-12%	<a href="https://eemis.eu/ERIF-2000-000P-1822">https://eemis.eu/ERIF-2000-000P-1822</a>
28-UTCB	Determination of fire resistance of non-load-bearing elements	Mineral Waste Valorisation into Construction Materials Research Center (CC VADEMC)	Engineering	5700	5000	-12%	<a href="https://eemis.eu/ERIF-2000-000P-1822">https://eemis.eu/ERIF-2000-000P-1822</a>

**Table 5. UTCB Graph - Comparison of Institutional and Market prices for the supplied External Services from UTCB.** Market prices are indicted in purple and Institutional prices in mint green. The grey spots indicate the fluctuation of the percentage of price divergence for each services provided. The numbers of the horizontal axis refer to the respective list of services offered by UTCB as shown in Annex II Table 4, category Engineering. The numbers of the left vertical axis refer to prices in euros and the numbers of the right vertical axis to the percentage of difference between Market and Institutional prices.



**Table 6. Market and Institutional prices for services supplied by UTCB (in euros/ hour)**

	External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	Diverting from market price	URL
1-UTC	Analysis of phenomena related to the production and propagation of the electromagnetic field	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	56	51	-9%	-
2-UTC	Harmonic analysis of measured quantities	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	57	52	-9%	-

3-UTCB	Analysis of technical issues related to operation, control, protection	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	54	48	-11%	-
4-UTCB	Measurement of analogue data (voltages, currents) and numerical data for nodes of the power system	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	50	44	-12%	-
5-UTCB	Measuring and evaluating the existing energy consumption	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	49	45	-8%	-
6-UTCB	Measuring the lighting technical parameters related to the lighting system	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	54	50	-7%	-
7-UTCB	Determination of energy parameters and performance indicators regarding power quality	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	62	55	-11%	-
8-UTCB	Experimental determinations regarding electromagnetic pollution	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	58	50	-14%	-
9-UTCB	Determination of sources with high risk of fire / explosion	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	54	50	-7%	-
10-UTCB	Dedicated automated driving systems for classic and unconventional facilities to ensure comfort and reduce energy consumption	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	60	54	-10%	-

	in buildings						
11-UTCB	Automation of energy and mass transfer processes in buildings	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	64	56	-13%	-
12-UTCB	Applications of robots in buildings	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	60	55	-8%	-
13-UTCB	Study on light pollution	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	54	50	-7%	-
14-UTCB	Measuring and calculations of lighting systems efficiency for indoor and outdoor solutions	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	57	50	-12%	-
15-UTCB	Multidisciplinary studies of the photocatalytic activity of building materials with depolluting and/or anti-microbial properties	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	64	60	-6%	-
16-UTCB	Technical lighting studies for indoor and outdoor spaces	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	61	52	-15%	-
17-UTCB	Electrical design studies for buildings	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	54	50	-7%	-
18-UTCB	Smart city technologies	Electrical Engineering and	Engineering	59	54	-8%	-

	and IoT	Lighting Research Center (CC-IELI)					
19-UTCB	Domotics, Immotics and Building Management System (BMS)	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	61	55	-10%	-
20-UTCB	Measuring of the lighting level	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	54	48	-11%	-
21-UTCB	Checking and validation of the lighting uniformity	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	51	45	-12%	-
22-UTCB	Measuring the colour temperature of light sources	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	53	48	-9%	-
23-UTCB	Measuring of luminous intensity	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	56	50	-11%	-
24-UTCB	Measuring of luminous flux	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	57	50	-12%	-
25-UTCB	Determination of the lighting systems energy efficiency	Electrical Engineering and Lighting Research Center (CC-IELI)	Engineering	53	48	-9%	-
26-UTCB	Use of modern measurement techniques in architecture, archaeology, restoration of monuments and historical sites	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	195	150	-23%	<a href="https://eiris.eu/ERIF-2000-000E-5110">https://eiris.eu/ERIF-2000-000E-5110</a>

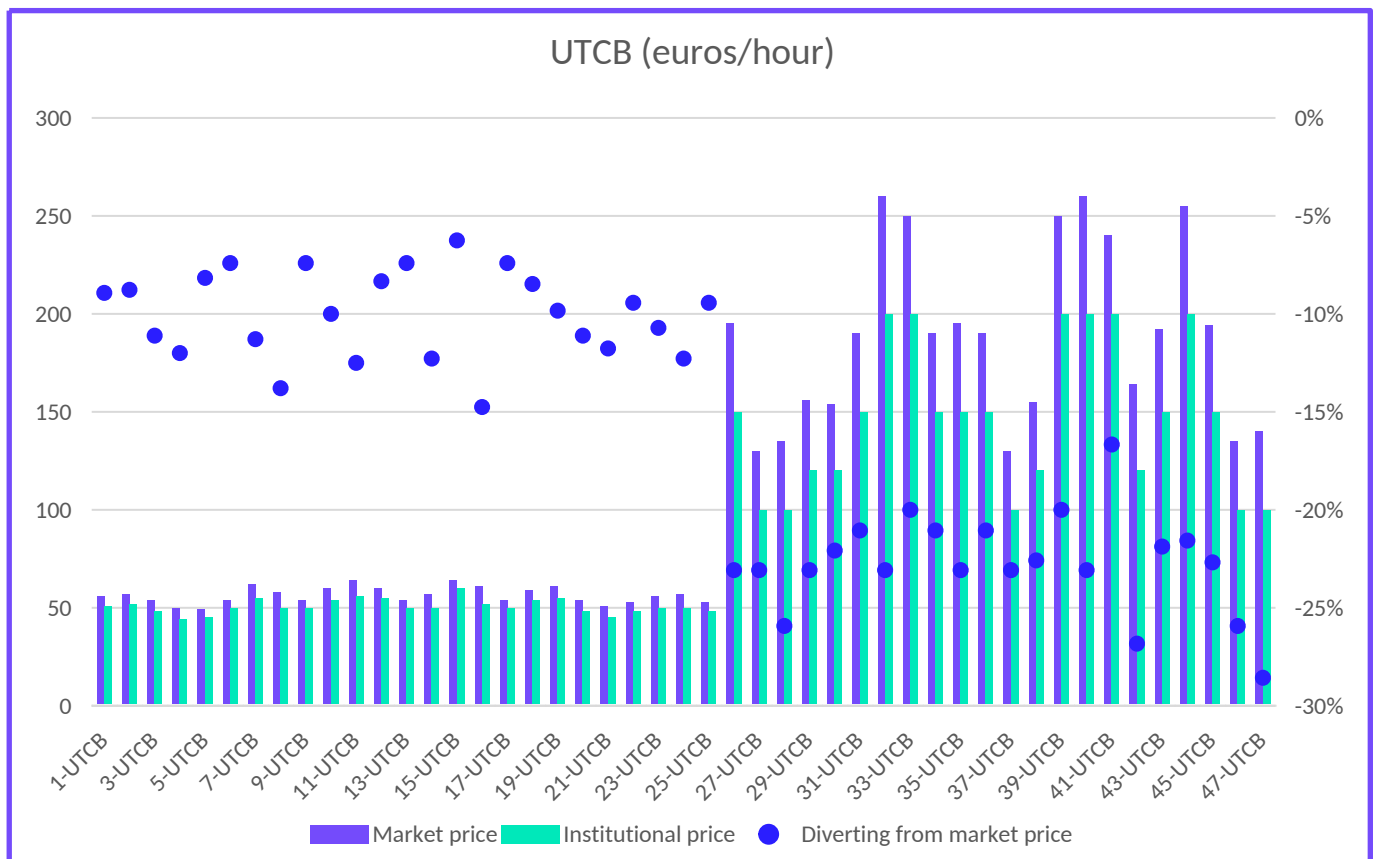


27-UTCB	Indoor and outdoor laser scanning	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	130	100	-23%	<a href="https://eeri.eu/ERIF-2000-000E-5110">https://eeri.eu/ERIF-2000-000E-5110</a>
28-UTCB	Designing geodetic networks and tracing networks for building objectives	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	135	100	-26%	<a href="https://eeri.eu/ERIF-2000-000E-5110">https://eeri.eu/ERIF-2000-000E-5110</a>
29-UTCB	Setting out points and positioning	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	156	120	-23%	<a href="https://eeri.eu/ERIF-2000-000E-5110">https://eeri.eu/ERIF-2000-000E-5110</a>
30-UTCB	Leading and managing the construction process	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	154	120	-22%	<a href="https://eeri.eu/ERIF-2000-000E-5110">https://eeri.eu/ERIF-2000-000E-5110</a>
31-UTCB	Construction control and work reception	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	190	150	-21%	<a href="https://eeri.eu/ERIF-2000-000E-5110">https://eeri.eu/ERIF-2000-000E-5110</a>
32-UTCB	Developing information systems for GIS management of real estate information system	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	260	200	-23%	<a href="https://eeri.eu/ERIF-2000-000E-5110">https://eeri.eu/ERIF-2000-000E-5110</a>
33-UTCB	Designing 3D models for the urban environment	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	250	200	-20%	<a href="https://eeri.eu/ERIF-2000-000E-5110">https://eeri.eu/ERIF-2000-000E-5110</a>
34-UTCB	Designing geospatial databases for various fields of activity	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	190	150	-21%	<a href="https://eeri.eu/ERIF-2000-000E-5110">https://eeri.eu/ERIF-2000-000E-5110</a>

		Center					
35-UTCB	Geospatial data management in the built environment using 3D GIS and BIM models	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	195	150	-23%	<a href="https://eeris.eu/ERIF-2000-000E-5110">https://eeris.eu/ERIF-2000-000E-5110</a>
36-UTCB	The integration of environmental data into urban information systems	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	190	150	-21%	<a href="https://eeris.eu/ERIF-2000-000E-5110">https://eeris.eu/ERIF-2000-000E-5110</a>
37-UTCB	The integration of real estate valuation data into urban information systems	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	130	100	-23%	<a href="https://eeris.eu/ERIF-2000-000E-5110">https://eeris.eu/ERIF-2000-000E-5110</a>
38-UTCB	The verification of cadastral works	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	155	120	-23%	<a href="https://eeris.eu/ERIF-2000-000E-5110">https://eeris.eu/ERIF-2000-000E-5110</a>
39-UTCB	The implementation of information systems for the efficiency of activities in public administration	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	250	200	-20%	<a href="https://eeris.eu/ERIF-2000-000E-5110">https://eeris.eu/ERIF-2000-000E-5110</a>
40-UTCB	Carrying out cadastral index plans using existing orthophotomaps and existing mapping materials	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	260	200	-23%	<a href="https://eeris.eu/ERIF-2000-000E-5110">https://eeris.eu/ERIF-2000-000E-5110</a>
41-UTCB	The introduction of information systems typical for the specific domains and	Geodetic Engineering Measurements and Spatial Data Infrastructures Research	Engineering	240	200	-17%	<a href="https://eeris.eu/ERIF-2000-000E-5110">https://eeris.eu/ERIF-2000-000E-5110</a>

	designing of urban data banks	Center					
42-UTCB	Mapping parcel maps	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	164	120	-27%	<a href="https://eemis.eu/ERIF-2000-000E-5110">https://eemis.eu/ERIF-2000-000E-5110</a>
43-UTCB	Specific Information Systems for Activity Domains	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	192	150	-22%	<a href="https://eemis.eu/ERIF-2000-000E-5110">https://eemis.eu/ERIF-2000-000E-5110</a>
44-UTCB	2D, 3D GIS and Geospatial Data Analysis	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	255	200	-22%	<a href="https://eemis.eu/ERIF-2000-000E-5110">https://eemis.eu/ERIF-2000-000E-5110</a>
45-UTCB	Valuation Methods	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	194	150	-23%	<a href="https://eemis.eu/ERIF-2000-000E-5110">https://eemis.eu/ERIF-2000-000E-5110</a>
46-UTCB	Tracking of deformations and displacements of the land	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	135	100	-26%	<a href="https://eemis.eu/ERIF-2000-000E-5110">https://eemis.eu/ERIF-2000-000E-5110</a>
47-UTCB	Surveying	Geodetic Engineering Measurements and Spatial Data Infrastructures Research Center	Engineering	140	100	-29%	<a href="https://eemis.eu/ERIF-2000-000E-5110">https://eemis.eu/ERIF-2000-000E-5110</a>

**Table 7. UTCB Graph - Comparison of Institutional and Market prices for the supplied External Services from UTCB.** Market prices are indicted in purple and Institutional prices in mint green. The grey spots indicate the fluctuation of the percentage of price divergence for each services provided. The numbers of the horizontal axis refer to the respective list of services offered by UTCB as shown in Annex II Table 6, category Engineering. The numbers of the left vertical axis refer to prices in euros/ hour and the numbers of the right vertical axis to the percentage of difference between Market and Institutional prices.



**Table 8. UTCb external services without relevant Market prices**

External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	URL
Water resources management studies	Groundwater Engineering Research Center (CCIAS)	Engineering	N/A	N/A	<a href="https://eeris.eu/ERIF-2000-000U-0366">https://eeris.eu/ERIF-2000-000U-0366</a>
Quality studies for groundwater	Groundwater Engineering Research Center (CCIAS)	Engineering	N/A	N/A	<a href="https://eeris.eu/ERIF-2000-000U-0366">https://eeris.eu/ERIF-2000-000U-0366</a>
Hydrological and hydrogeological measurements	Groundwater Engineering Research Center (CCIAS)	Engineering	N/A	N/A	<a href="https://eeris.eu/ERIF-2000-000U-0366">https://eeris.eu/ERIF-2000-000U-0366</a>
Hydrogeological maps	Groundwater Engineering Research Center (CCIAS)	Engineering	N/A	N/A	<a href="https://eeris.eu/ERIF-2000-000U-0366">https://eeris.eu/ERIF-2000-000U-0366</a>
Contaminated Site Management	Groundwater Engineering Research Center (CCIAS)	Engineering	N/A	N/A	<a href="https://eeris.eu/ERIF-2000-000U-0366">https://eeris.eu/ERIF-2000-000U-0366</a>
Fundamental processes of heat and mass transfer	Thermal Systems Research Center (SITER)	Engineering	N/A	N/A	<a href="https://eeris.eu/ERIF-2000-000P-1822">https://eeris.eu/ERIF-2000-000P-1822</a>

## ANNEX III – UCV external services price benchmarking

Table 9. Market and Institutional prices for services supplied by UCV (Research & Consultancy category)

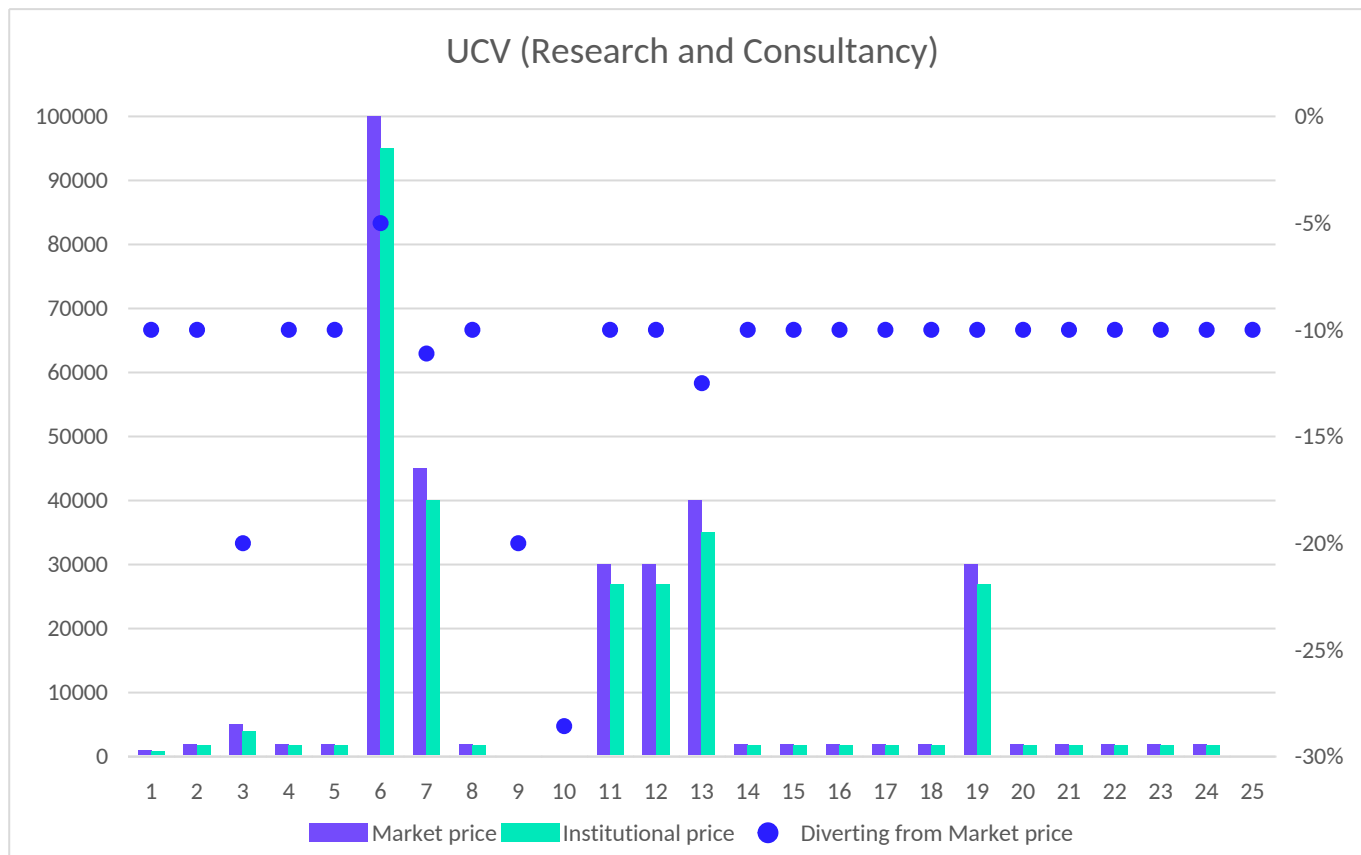
	External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	Diverting from Market price	URL
1-UCV	Development of biotic indices.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	1000	900	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
2-UCV	Ecological monitoring of artificial reefs.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
3-UCV	Regeneration of underwater habitats.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	5000	4000	-20%	<a href="#">List of services   IMEDMAR - UCV</a>
4-UCV	Research on threatened marine species and communities	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
5-UCV	Ecological study and control of fish farms.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
6-UCV	Design and evaluation of aquaculture projects.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	100000	95000	-5%	<a href="#">List of services   IMEDMAR - UCV</a>
7-UCV	Fisheries studies.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	45000	40000	-11%	<a href="#">List of services   IMEDMAR - UCV</a>
8-UCV	Oceanographic characterisation of the marine and coastal environment of both the water column and sediment	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
9-UCV	Water quality analysis	Institute for Research in Environment and	Research and consultancy	100	80	-20%	<a href="#">List of services   IMEDMAR -</a>

		Marine Science (IMEDMAR)					<a href="#">UCV</a>
10-UCV	Analysis of pollutants (heavy metals)	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	70	50	-29%	<a href="#">List of services   IMEDMAR - UCV</a>
11-UCV	Coastal hydrodynamics.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	30000	27000	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
12-UCV	Coastal flooding.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	30000	27000	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
13-UCV	Integral study of the coast from a geomorphological perspective.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	40000	35000	-13%	<a href="#">List of services   IMEDMAR - UCV</a>
14-UCV	Coastal monitoring.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
15-UCV	Palaeoenvironmental reconstructions and their relationship with sea level variations.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
16-UCV	Palaeogeographical studies.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
17-UCV	Land use and management studies.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
18-UCV	Landscape studies.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
19-UCV	High-precision technical studies (DGPS, echosounders) for the development of topographic projects of the coastline in	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	30000	27000	-10%	<a href="#">List of services   IMEDMAR - UCV</a>

	coastal systems						
20-UCV	Morpho dynamic evolution of beaches.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
21-UCV	Monitoring of beach topography and study of variations in volume and geomorphology of dunes, beaches and other coastal systems.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
22-UCV	Morpho dynamics and stratigraphy of the continental shelf	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
23-UCV	Characterisation of marine currents and water masses.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
24-UCV	Seabed facies mapping.	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
25-UCV	Sediment sampling with dredges	Institute for Research in Environment and Marine Science (IMEDMAR)	Research and consultancy	50	45	-10%	<a href="#">List of services   IMEDMAR - UCV</a>

**Table 10. UCV Graph - Comparison of Institutional and Market prices for the supplied External Services from UCV.** Market prices are indicted in purple and Institutional prices in mint green. The grey spots indicate the fluctuation of the percentage of price divergence for each services provided. The numbers of the horizontal axis refer to the respective list of services offered by UCV as shown in Annex III Table 9, category Research and Consultancy. The numbers of the

left vertical axis refer to prices in euros and the numbers of the right vertical axis to the percentage of difference between Market and Institutional prices.



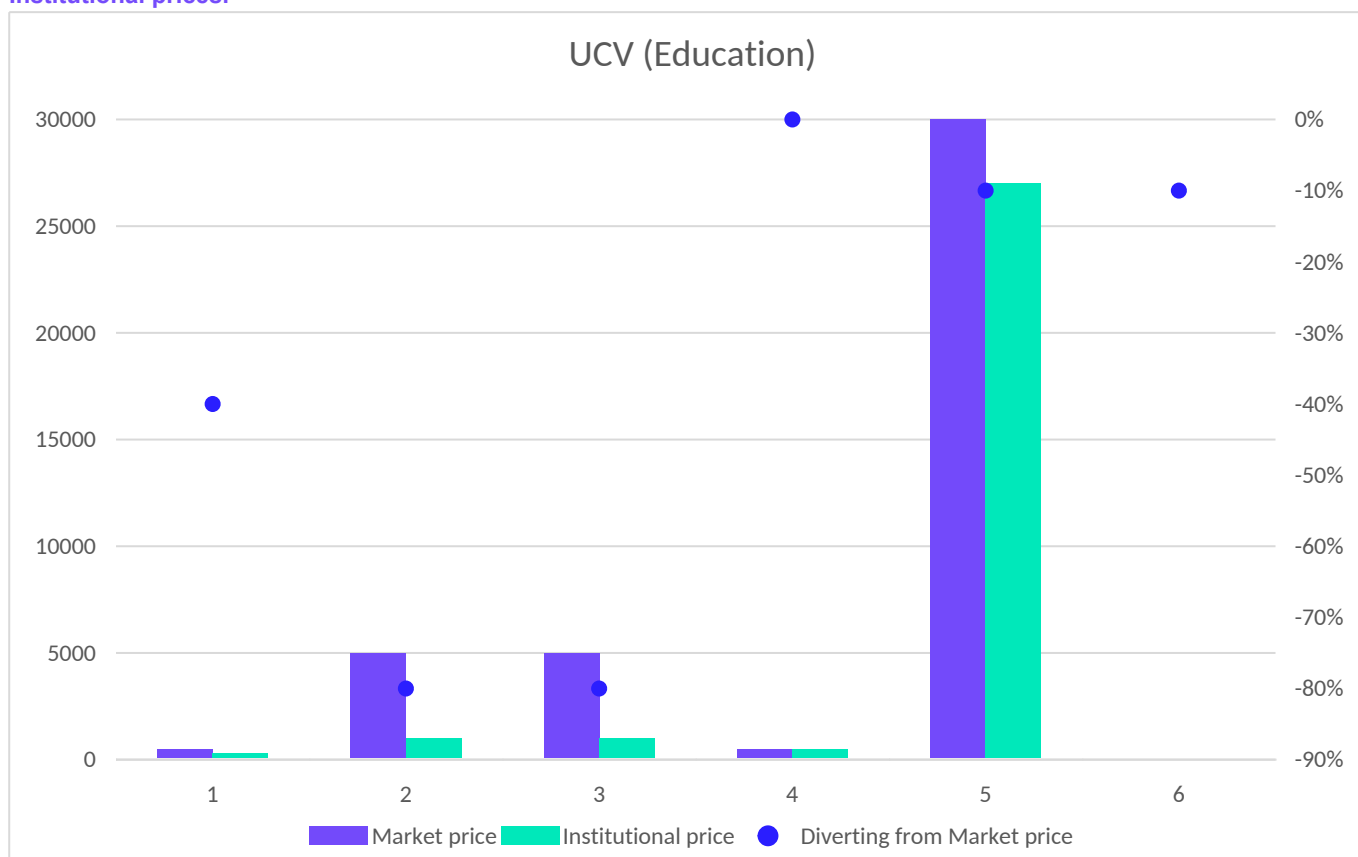
**Table 11. Market and Institutional prices for services supplied by UCV (Education category)**

	External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	Diverting from Market price	URL
1-UCV	Offer of the laboratories and facilities to educational centres and for the development of ad-hoc practices	Institute for Research in Environment and Marine Science (IMEDMAR)	Education	500	300	-40%	<a href="#">List of services   IMEDMAR - UCV</a>
2-UCV	Conducting workshops and conferences on environmental education for all levels.	Institute for Research in Environment and Marine Science (IMEDMAR)	Education	5000	1000	-80%	<a href="#">List of services   IMEDMAR - UCV</a>
3-UCV	Combined activities with water sports companies and other companies such as hotels.	Institute for Research in Environment and Marine Science (IMEDMAR)	Education	5000	1000	-80%	<a href="#">List of services   IMEDMAR - UCV</a>



4-UCV	Aula del Mar and summer school.	Institute for Research in Environment and Marine Science (IMEDMAR)	Education	500	500	0%	<a href="#">List of services   IMEDMAR - UCV</a>
5-UCV	Development of underwater trails: underwater guides with underwater panels	Institute for Research in Environment and Marine Science (IMEDMAR)	Education	30000	27000	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
6-UCV	Taxonomic identification of marine organisms for biodiversity inventories and data banks	Institute for Research in Environment and Marine Science (IMEDMAR)	Education	50	45	-10%	<a href="#">List of services   IMEDMAR - UCV</a>

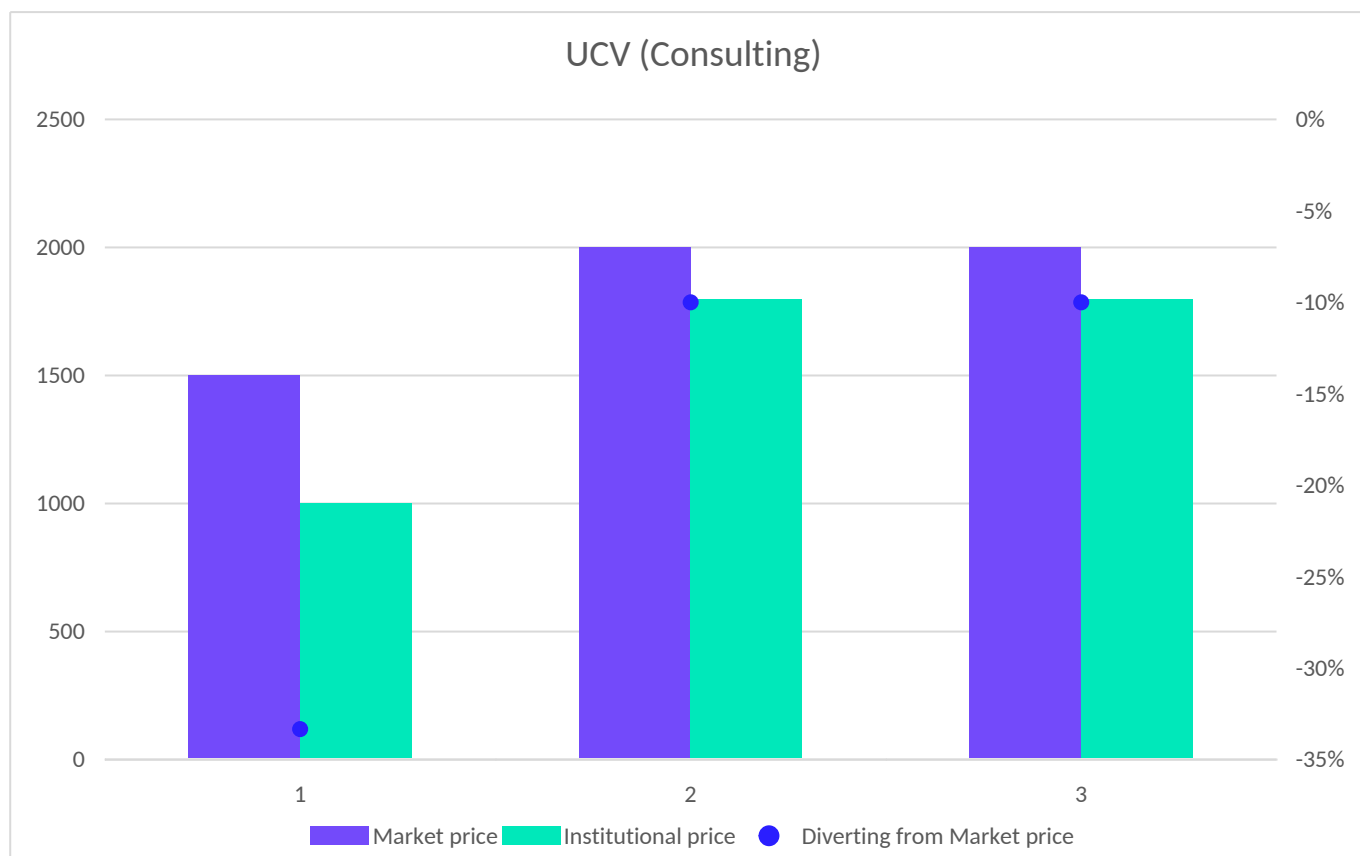
**Table 12. UCV Graph - Comparison of Institutional and Market prices for the supplied External Services from UCV.** Market prices are indicted in purple and Institutional prices in mint green. The grey spots indicate the fluctuation of the percentage of price divergence for each services provided. The numbers of the horizontal axis refer to the respective list of services offered by UCV as shown in Annex III Table 11, category Education. The numbers of the left vertical axis refer to prices in euros and the numbers of the right vertical axis to the percentage of difference between Market and Institutional prices.



**Table 13. Market and Institutional prices for services supplied by UCV (Consulting category)**

	External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	Diverting from Market price	URL
UCV-1	Advice and preparation of training activities in marine biology and ecology.	Institute for Research in Environment and Marine Science (IMEDMAR)	Consulting	1500	1000	-33%	<a href="#">List of services   IMEDMAR - UCV</a>
UCV-2	Environmental impact studies.	Institute for Research in Environment and Marine Science (IMEDMAR)	Consulting	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>
UCV-3	Water Framework Directive studies and impact indices.	Institute for Research in Environment and Marine Science (IMEDMAR)	Consulting	2000	1800	-10%	<a href="#">List of services   IMEDMAR - UCV</a>

**Table 14. UCV Graph - Comparison of Institutional and Market prices for the supplied External Services from UCV. Market prices are indicted in purple and Institutional prices in mint green. The grey spots indicate the fluctuation of the percentage of price divergence for each services provided. The numbers of the horizontal axis refer to the respective list of services offered by UCV as shown in Annex III Table 13, category Consulting. The numbers of the left vertical axis refer to prices in euros and the numbers of the right vertical axis to the percentage of difference between Market and Institutional prices.**



**Table 15. UCV external services without relevant Market and/ or Institutional prices**

External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	URL
Language courses of Spanish (A1 to C1)	UCV Language Institute	Education and Training	450 Eur	upon demand	<a href="#">Instituto de Lenguas UCV</a>
Spanish for dentistry	UCV Language Institute	Education and Training	450 Eur	upon demand	<a href="#">Instituto de Lenguas UCV</a>
Spanish for Speech Therapy	UCV Language Institute	Education and Training	450 Eur	upon demand	<a href="#">Instituto de Lenguas UCV</a>
English courses (B1, B2, C1, C2)	UCV Language Institute	Education and Training	450 Eur	upon demand	<a href="#">Instituto de Lenguas UCV</a>
English for sustainability	UCV Language Institute	Education and Training	450 Eur	upon demand	<a href="#">Instituto de Lenguas UCV</a>
TRANSLATION SERVICES	UCV Language Institute	Education and Training	upon demand	upon demand	<a href="#">Instituto de Lenguas UCV</a>

LINGUISTIC ADVICE	UCV Language Institute	Education and Training	upon demand	upon demand	<a href="#">Instituto de Lenguas UCV</a>
Official certificates	UCV Language Institute	Education and Training	upon demand	upon demand	<a href="#">Instituto de Lenguas UCV</a>
PEARSON	UCV Language Institute	Education and Training	upon demand	upon demand	<a href="#">Instituto de Lenguas UCV</a>
CIEACOVA	UCV Language Institute	Education and Training	upon demand	upon demand	<a href="#">Instituto de Lenguas UCV</a>
LANGUAGE PROFICIENCY TEST	UCV Language Institute	Education and Training	upon demand	upon demand	<a href="#">Instituto de Lenguas UCV</a>
LANGUAGE PROFICIENCY TEST FOR TEACHERS	UCV Language Institute	Education and Training	upon demand	upon demand	<a href="#">Instituto de Lenguas UCV</a>

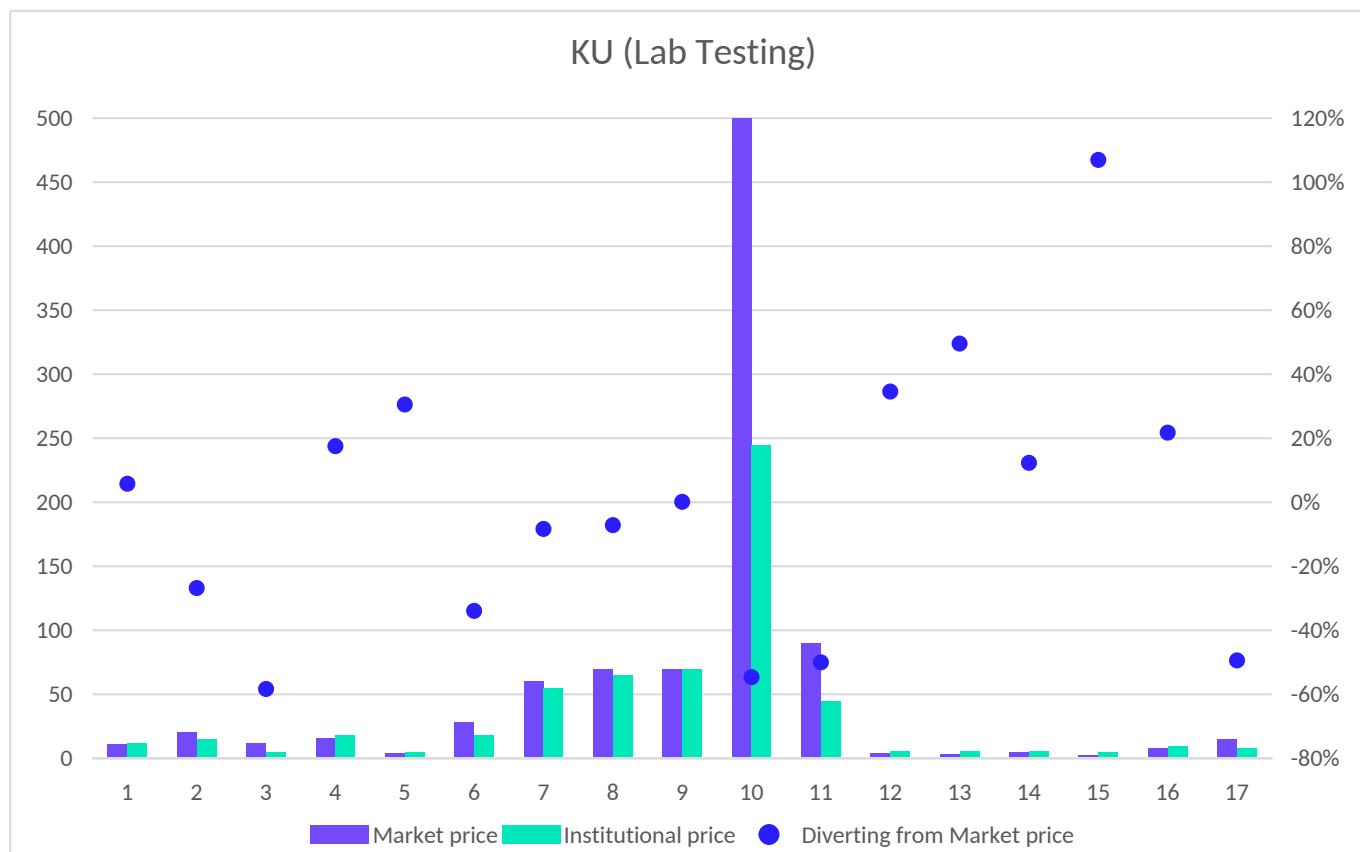
## ANNEX IV – KU external services price benchmarking

Table 16. Market and Institutional prices for services supplied by KU

	External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	Diverting from Market price
1-KU	Particle size distribution and standard physical properties of sandy soils	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	10,87	11,5	6%
2-KU	Particle size distribution and standard physical properties of silt	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	20,49	15	-27%
3-KU	Determination of organic matter content in the soils	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	12	5	-58%
4-KU	Plastic and liquid limits (Atterberg limits) of soils	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	15,74	18,5	18%
5-KU	Water content determination of soils	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	3,83	5	31%
6-KU	Determination of the filtration coefficient of soils	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	28	18,5	-34%

6-KU	Direct shear test of sandy soils	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	60	55	-8%
8-KU	Direct shear test of clay/silt	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	70	65	-7%
9-KU	Incremental loading oedometer test	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	69,9	70	0%
10-KU	Triaxial test	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	540	245	-55%
11-KU	Unconfined compression test	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	90	45	-50%
12-KU	Ammonium ( $\text{NH}_4^+$ ) analysis in filtered water samples	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	4,25	5,72	35%
13-KU	Nitrite ( $\text{NO}_2^-$ ) analysis in filtered water samples	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	3,55	5,31	50%
14-KU	Nitrate ( $\text{NO}_3^-$ ) analysis in filtered water samples	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	4,95	5,56	12%
15-KU	Phosphate ( $\text{PO}_4^{3-}$ ) analysis in filtered water samples	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	2,44	5,05	107%
16-KU	Total nitrogen analysis in filtered and unfiltered water samples	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	8	9,74	22%
17-KU	Determination of bacterial abundance	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	15,14	7,66	-49%

**Table 17. KU Graph - Comparison of Institutional and Market prices for the supplied External Services from KU. Market prices are indicted in purple and Institutional prices in mint green. The grey spots indicate the fluctuation of the percentage of price divergence for each services provided. The numbers of the horizontal axis refer to the respective list of services offered by KU as shown in Annex IV Table 16, category Lab testing. The numbers of the left vertical axis refer to prices in euros and the numbers of the right vertical axis to the percentage of difference between Market and Institutional prices.**



**Table 18. KU external services without relevant Market prices**

External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)
Quantitative and qualitative analysis of phytoplankton	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	54.93
Quantitative and qualitative analysis of zooplankton	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	40.55
Quantitative and qualitative analysis of zooplankton (non-standard sample)	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	78.98

Geomechanical properties of soils: Undrained shear strength	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	45.00
Geomechanical properties of soils: Cohesion and angle of internal friction for sandy soils	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	55.00
Geomechanical properties of soils: Cohesion and angle of internal friction for clays/silts	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	65.00
Geomechanical properties of soils: Oedometer modulus	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	70.00
DOC analysis in filtered water samples	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	11.37
Elemental soil, sediment, sludge, rock sample analysis, 10 elements from the list: Ag, Al, As, Ba, Br, Ca, Cd, Ce, Co, Cr, Cu, Ga, Hg, Fe, K, Mg, Mn, Na, Nb, Ni, P, Pb, Rb, S, Si, Sn, Sr, Th, Ti, Tl, U, V, W, Y, Zn, Zr)	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	75.00
Full X-ray fluorescence analysis of samples of environmental components (soil, sediment / sludge, rocks) using Turboquant II Pressed Pellets module (Ag, Al, As, Ba, Bi, Br, Ca, Cl, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Ge, Hf, Hg, I, In, K, La, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Pd, Rb, Rh, Ru, S, Sb, Se, Si, Sm, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn, Zr)	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	100.00
Analysis of pigment	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	12.37
Identification of volatile and semi - volatile compounds	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	90.00
Silica (SiO <sub>2</sub> ) analysis in filtered water samples	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Lab testing	N/A	5.67

Measurement of diesel and biodiesel lubricity	Waterborne Transport and Air Pollution Laboratory of Marine Research Institute	Lab testing	N/A	75.00
Measurement of Diesel and biodiesel oxidative stability	Waterborne Transport and Air Pollution Laboratory of Marine Research Institute	Lab testing	N/A	18 .00
Measurement of air pollutants in ambient air	Waterborne Transport and Air Pollution Laboratory of Marine Research Institute	Field testing	N/A	upon demand
Determination of feed efficiency for fish in RAS	Fishery and Aquaculture Laboratory of Marine Research Institute	Breeding/ Cultivation	N/A	upon demand
Determination of feed efficiency for shrimp in RAS	Fishery and Aquaculture Laboratory of Marine Research Institute	Breeding/ Cultivation	N/A	upon demand
Development of aquaculture biotechnology (new species) for RAS	Fishery and Aquaculture Laboratory of Marine Research Institute	Breeding/ Cultivation	N/A	upon demand
Optimization of aquaculture biotechnology for RAS according to specific biological, chemical or technological parameters	Fishery and Aquaculture Laboratory of Marine Research Institute	Breeding/ Cultivation	N/A	upon demand
Growing of cultures	Coastal Environment and Biogeochemistry Laboratory of Marine Research Institute	Breeding/ Cultivation	N/A	upon demand

## ANNEX V – LRUniv external services price benchmarking

Table 19. LRUniv external services without relevant Market prices

External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)	URL
Scanning Electron Microscopy (SEM)	Laboratory of Engineering Sciences for the Environment (LaSIE)	Lab testing	upon demand	247	<a href="https://lasie.univ-larochelle.fr/Secteur-Microscopie-Electronique-au-LaSIE-Universite-de-La-Rochelle">https://lasie.univ-larochelle.fr/Secteur-Microscopie-Electronique-au-LaSIE-Universite-de-La-Rochelle</a>



Transmission Electron Microscopy (TEM)	Laboratory of Engineering Sciences for the Environment (LaSIE)	Lab testing	upon demand	459	<a href="https://lasie.univ-larochelle.fr/Secteur-Microscopie-Electronique-au-LaSIE-Universite-de-La-Rochelle">https://lasie.univ-larochelle.fr/Secteur-Microscopie-Electronique-au-LaSIE-Universite-de-La-Rochelle</a>
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## ANNEX VI – FredU external services price benchmarking

Table 20. FredU external services without relevant Market prices

External Service	Research Unit	CATEGORY	Market price (€)	Institutional price (€)
Smart sensors development for smart units/ large scale development for smart cities	Antennas and Microwaves Group - AMG	Engineering	N/A	Study 10,000 euros
3d printing design and printing / moulding	BioNM Lab	Engineering	N/A	€50/hr + overheads (design, preparation for printing, gluing 3d-printing parts, manufacture moulds) plus cost of material (resin and / or various plastics)
5G-and-beyond networks / 6G networks	Networks Research Laboratory (NETLAB)	Engineering	N/A	50 Euro/ Hour
Communication technologies in Smart systems (home, transportation, healthcare)	Networks Research Laboratory (NETLAB)	Engineering	N/A	50 Euro/ Hour
Communication technologies in Internet-of-Things (IoT) architectures (industrial, maritime)	Networks Research Laboratory (NETLAB)	Engineering	N/A	50 Euro/ Hour
Blockchain technology in communication networks	Networks Research Laboratory (NETLAB)	Engineering	N/A	50 Euro/ Hour
Outdoor pedagogic sessions developed from our training, research and work in this field.	Forest School for Children and Educators	Consulting	N/A	2000 Euro
Mapping of habitats: Survey and mapping of habitats that exist in an area	Nature Conservation Unit	Consulting	N/A	20 Euro / Hour (travelling not included)
Ecosystem Services assessment: Implementation of ecosystem services mapping activities and calculation of carbon stored in areas.	Nature Conservation Unit	Consulting	N/A	20 Euro / Hour (travelling not included)
recording of people's personal stories that have to do with coastal areas. Sustainability is connected with the stories we tell and preserve	Oral History and Education Research	Consulting	N/A	2000 Euro

and pass on to the new generations.				
spatial/ city/ landscape planning, GIS, sustainable urban design, energy systems and the built environment, segregation and place inclusiveness, design for aging, planning law and property rights, sustainable urban mobility, spatial governance, building design concepts and property development/ strategy and briefs, master planning, terms and conditions for open design competitions and urban renewal projects, environmental impact assessments.	Urban Planning and Development Unit (UPDU)	Consulting	N/A	Frederick University fixed human hour cost
The main goals of the team are to promote scientific research in the area of Social Work, undertake and conduct research in Social and Humanities domains, prepare research proposals, participate and implement national and international research projects.	Social Welfare Research Team	Field Testing	N/A	30 Euro / Hour
Seed germination: Implementation of seed germination protocols for the germination and development of (plant) saplings	Nature Conservation Unit	Lab testing	N/A	20 Euro / Hour (travelling not included)