

Πρόταση συνεργασίας TUC- UKMO in Algeria

A. QUALITY OF PROJECT DESIGN AND COOPERATION ARRANGEMENTS

Ερώτημα Α (Σε επίπεδο Σχεδίου/για όλες τις προτάσεις συνεργασίας με ιδρύματα, 40 βαθμοί)

TUC is an outward looking HEI, whose main aim is to provide high-quality education to students and research opportunities to staff members, driven by excellence in research, teaching and innovation, through strong ties with international organizations that give complementarity and add to the excellence standard of the entire team. In 2016, the external Higher Education Evaluation committee ranked it amongst the 10 best achieving institutions in Greece. The same year, TUC submitted a successful application at the ICM Call. In the last 27 years has signed a significant number of MoUs, more than 100 Inter-Institutional Agreements under Erasmus program and has received and sent hundreds of international distinguished academics, scholars and students to and from European and non-European Universities (Israel, Jordan, U.S.A, China, Botswana, Canada, South Africa, Armenia, Ecuador, Laos, Serbia, Chile, India, New Zealand). After the end of the inter-institutional agreements, channels of cooperation are maintained either at the level of Faculties or at the level of research working groups between the partner Institutions. For this reason, the cooperation with the majority of the Institutions continues in the plans 2019-22 and 2020-3 within the framework of the international mobility program. Although the majority of the Institutions expressed interest in continuing the collaborations under the same program, the TUC in the new mobility plan (call 2022) gave priority to collaborating with new Institutions in the same educational fields in order to expand its global cooperation network on international issues.

Preparation for the submission of the cooperation proposal: The responsible persons for the implementation of the program are predetermined **in writing**, while pre-agreed the observance of the principles and procedures, as foreseen in the inter-institutional agreement. In the preliminary cooperation agreement both Institutions have defined: Erasmus management officers for the implementation of the program (TUC: Markos Ntoukakis/Erasmus office) and Inclusion Officers (TUC: Lefteris Maragkoudakis/Erasmus office) who undertake to reach out and increase accessibility to more participants with fewer mobility opportunities. In addition, Erasmus academic Institution coordinators (TUC: Prof. Michael Zervakis/Vice Rector) and the legally responsables for the conclusion of the inter institutional agreement (TUC: Prof. Evangelos Diamantopoulos /Rector). Erasmus Offices of the partner Institutions communicate with e-mail, skype, cloud storage services (Dropbox) for file sharing on the needs of the project. Basic parameters of the cooperation have been regulated, such as the procedures for the information of the academic communities and the invitation ways to participation in mobility, the selection criteria for applicants and the recommendation of the evaluation committee. In addition it is identified the educational field(s) of the project, the participating faculties from each Institution, the academic coordinators from each faculty (TUC: <https://www.tuc.gr/index.php?id=12861&L=928%27>) and academic calendars are exchanged (TUC: <https://www.tuc.gr/index.php?id=3624>). Specifically for student mobility (1st, 2st cycle) the Erasmus officers exchange information about the required language skills and the offered courses of each faculty (TUC: <https://www.tuc.gr/index.php?id=534&L=928%27>). Also, information is exchanged regarding the professors who can supervise thesis for students and for those who can contribute the activities of incoming staff, for the organizations that can employ students for traineeship and for the required language skills of incoming participants in each institution. After the mobility grant, each Erasmus officer will post announcements on the official websites and social media accounts about the procedures and benefits of the Erasmus program. The Inclusion officers will post information about the possibilities, the criteria and the capabilities of the program

for the support of vulnerable groups. At the same time, the Erasmus officers in collaboration with the academic coordinators of participating faculties of each Institution will relate the offered courses for the incoming Erasmus students. The inter-institutional agreement will then be checked by the Erasmus Institution Coordinator and be signed by the legal representative of each Institution. After the signing, the Erasmus officers and the Inclusion officers will post invitation on the media and sessions will be organized to inform the academic communities for the approved mobilities. The invitation to participate in the program for staff and students by the Erasmus officers will be composed in the pre-agreed way at the same time in both Institutions if this is possible for better control of the process. Applicant outgoing students from TUC evaluated by the motivation to participate in mobility, from their activities in the specific educational field, while priority will be given to students with fewer opportunities to participate in mobility. A point allocation system evaluate outgoing staff of TUC, based on the years of their employment at TUC, the time since the last participation in mobility and the submitted activity plan. Erasmus officer at the Partner Institution informs in writing the Erasmus office of TUC about the procedures of information, selection and evaluation of the candidates. In this way, TUC as the coordinator of the program ensures a selection process fair, transparent and documented, ensuring equal opportunities to participants eligible for mobility. Details for the pre-planning of the cooperation with each candidate Institution are given in in the corresponding section.

Before the mobility: The required arrangements in the Inter institutional Agreement to support the participants before the mobility for procedures related to visa, insurance, travel, accommodation, integration and linguistic support of students will be implemented in collaboration with the Erasmus officers and Inclusion officers of both Institutions. They are responsible to post information on the websites of their institutions about the above procedures and to provide administrative support and advice to participants. Incoming students at each Institution can receive additional information for the planning of their studies from the Erasmus academic coordinators of each faculty and from professors who specialize in the educational field of the cooperation and have stated that they can co-supervise their thesis. Incoming staff at each Institution can receive additional information from members of TUC who specialize in the same education field and have stated that they can contribute to their activities. In this way, the participants will have all the information for the planning of their activities in the mobility agreements. Incoming students to TUC can receive additional information about their stay in Chania from the Erasmus Student Network (ESN) at TUC (<https://tuc.esngreece.gr/about-us>). The Inter-institutional agreement clearly states that TUC's Erasmus office will manage the OS and will be responsible for uploading and updating the Mobility Tool. Under the terms of the Erasmus Program, students will not be required to pay any tuition fees to the host Institution. TUC, as applicant and Coordinator, will be in charge for the financial management, conforming to the guidelines and policies of the European Commission and the National Agency (IKY). All grants and travel expenses of the Erasmus+ International Credit Mobility Program participants will be covered by the TUC. The data required for the signing of the grant agreement (visa, insurance contract, bank account, tickets) will be collected and checked by the Erasmus office of TUC. The prepayment (80%) will be granted to participants at least one month before the start of mobility. The disbursement of money and their deposit in the bank accounts of the participants is a responsibility of finance department of TUC, "Special Account for Research Funding–ELKE" (<https://www.elke.tuc.gr/en/home>) in collaboration with the Erasmus office of TUC.

During the mobility: In addition to the participant support procedures mentioned in the inter-institutional agreement, upon arrival of the grantees, TUC Erasmus Office will organize a campus-tour and a meeting in order to inform the applicants regarding the city, the transportation and the campus life. TUC will offer free the student ID card and full access to classic core ICT services (e.g. e-mails account, Wi-Fi, etc), to library, in campus sports installations, at meals and in public transport at low prices. TUC's Language Research and Resources Center contribute to the improvement of the linguistic skills of Greek students by offering free of

charge lessons in English language and free lessons in Greek language to incoming students. Students and academic staff with physical disabilities have full access to all above activities and services. There are spacious elevators and parking facilities, so that all the physical barriers are eliminated and many laboratories are on the ground floor. TUC will integrate incoming students and staff by encouraging them to participate in students' associations and campus life, cultural activities and visits. The Erasmus academic coordinators of participating faculties will attend their studies in the courses provided in the learning agreements. An appointed team of Professors will co-supervise the progress of their dissertation and will also draw a final report at the end of their mobility period, in order to facilitate the recognition of the learning outcomes. Incoming students are expected to participate to presentations, seminars, conferences or other academic and scientific activities in order to diffuse the acquired and gained knowledge. Particularly important is the contribution of the Erasmus student association (ESN) for the integration of incoming students in community of TUC and in the social life of the city.

After the mobility: The original Certificate of Attendance that will be handed from the Erasmus officer of TUC will be the proof of recognition for the mobility period. Erasmus officer at the partner institution will be required to provide written recognition of the courses and postgraduate and doctoral studies (part of thesis) for TUC outgoing students. After the final check of all the presented documents, the participants will receive from ELKE the remaining 20% of the grant. After the end of mobility, participants have to submit the EU Report. The final reports in combination with the open-ended questionnaire to the participants are used to evaluate each mobility. In short, participants are asked if they have implemented the planned activities and if they are satisfied with the services (information, criteria for selecting participants, measures to support vulnerable groups) provided by Erasmus offices and academic coordinators from each institution before, during and after mobility. Every answer must be justified. The processing of the participants' reports in combination with the above questionnaire and the final evaluation of the project by the IKY are used as indicators for the evaluation of the project and are discussed in a special session of the Erasmus office contributes to the continuous improvement of the implementation of the mobility program. Participants' activities post on the Erasmus website and presented by them at an event organized by the Erasmus Office after the end of each mobility project, which is attended by the entire academic community. In this meeting, the participants discuss the benefits and potential problems that arose during the project and propose solutions to improve the planning and management of the mobility program.

B. RELEVANCE OF STRATEGY Ερώτημα Β (Σε επίπεδο Ιδρύματος, 40 βαθμοί)

The School of Mineral Resources Engineering (MRED) of TUC and the Faculty of Hydrocarbons Renewable Energies Earths Sciences and the Universe at University Kasdi Merbah Ouargla (UKMO) in Algeria and Institute of Technology at UKMO will participate at the proposed collaboration in the education fields "Physical sciences" (ISCED code: 053) and "Engineering and engineering trades" (ISCED code: 071). The scientific objects focusing on research oriented to mitigation of fossil fuels exploitation impact on the environment (CO₂ capture and storage technologies), on exploration and exploitation of energy resources and in particular on source rock characterization and organic geochemistry analysis, in shale gas exploration connected to the related environmental impact assessment, and on natural and biogenic gas research.

UKMO has been founded in 1988 and is evolving since then, being today an Institution of 10 faculties, 2 institutes and 32 departments with a dynamic academic presence and research activity in various scientific fields, while it has being granted as a national excellence pole in the hydrocarbons and agronomy fields. International cooperation is a major challenge for an institution being one of the most attractive academic institutions for students from diverse backgrounds and making them successful, through privileged

partnerships, international co-diplomas and the promotion of research through a win-win partnership. In this context, UKMO involved with the mounting and membership in European projects characterized by their high-tech should be raised. The proven and ambitious skills that translate human and material potentials and regional and national assets of UKMO in concrete projects for educational and scientific development, knowing that for the moment, European cooperation projects, such as Erasmus Plus and Horizon – Europe are the only ones who offer this possibility. This consequence, UKMO positively adheres to all initiatives and cooperation process, engaging in European projects. While interested to have collaboration in the Erasmus Plus programs in the following topics: International Credit Mobility, Capacity Building in the Field of Higher Education, the Institution will play a key role in the economic development of the country by contributing research results to the improvement and development of investigation techniques in reservoirs, consequently increasing the rate of production of hydrocarbons.

In partnership with an Institute with such mastery of hydrocarbons enabled this proposal, because for TUC it is crucial to promote cutting edge research on topics such as mineral resources especially during a period characterized by the global attempt to transform the energy sector to having a more environment-friendly profile. The climate change makes it urgent to adapt and engage to find ways to manage global energy resources optimal with the view to sustainability regarding our planet and the next generations to come. The cooperation with UKMO has been chosen as the two Institutes show great similarities on their curriculums, which could benefit all the involved students and academic staff to enhance, through such interaction, their common interest research in energy transition. In more detail, the research of both departments shows great correspondence in the exploration and exploitation of energy resources, focusing on source rock characterization and organic geochemistry analysis, shale gas exploration connected to the related environmental impact assessment as well as natural and biogenic gas research. The Institutes could gain precious insights and hands-on experience associated with their academic and research programs, using the available laboratories and software linked to these research fields. Being able to take part in this mobility, the academic staff will have the chance to exchange relevant know-how, improving their academic profile, and sharpening their knowledge. This interaction aims to introduce new insights into research, through such high-end research collaborations towards scientific disciplines that deal with the fight against climate change and green energy transformation to more sustainable forms. It will give the opportunity of crucial research findings that through international coordinated interaction will be disseminated to an enhanced part of the community and be the incentive that will drive to more and deeper research interest and engagement to the subject.

TUC has previously collaborated with Institutions in Israel and Jordan under the international Erasmus program. It is the first time TUC is ready to undertake a scientific collaboration plan with UKMO and so far, no previous experience exists in such collaboration with Algerian HEIs or other Algerian organizations. Thus, it is considered to be an actual breakthrough exchange of energy resources exploration and exploitation knowhow, given the specialization of UKMO on environmental impact assessment, which will enhance the relevant research of TUC in energy efficiency techniques, regarding the energy transition plan of Greece, and the “Vision 2050” of EU. Especially research directions, enabling the energy transition, like the Carbon Capture and Storage will be in the center of this collaboration, by employing the experience of both partners in exploration and exploitation of the subsurface energy resources. As Greece has a strategic plan on Energy transition which is very much based on the natural gas usage, such a collaboration between the two HEIs could be proven propitious. This will be achieved in the sense that pertinent practices and know-how will be shared while UKMO has a significant background in this very field of research. The two academic parts will delve into petroleum, natural and biogenic gas generation potential in neighboring areas, assessing not only their potential, but also the location of generation, which could reveal new insights into such research. Additionally, exploitation related environmental impact assessment of the latter is planned to be studied, alongside with

CO2 capture and storage technologies. Scientific equipment already available in the two academic parts, such as GC-MS, Rock Eval pyrolysis, TGA, CO2 capture pump, will be used jointly with the experienced of both teams and will produce interesting insights of the mentioned topics. This will not only lead to scientific publications and participations in conferences of international level, but also to potentially state-of-the art methods of analysis for the fields under evaluation. It should also be noted that the interchange period of the outgoing staff/students will be completed or extended by digital cooperation, not only achieving effective communication, but also enhancing the period of interaction that it is believed to be very promising to lead to new paths of collaborative research. Finally, sharing the already gained knowledge of the exploration and exploitation of such energy sources, as well as the new insights to be acquired on these, would definitely be proven beneficial for both countries but specially for Greece by assisting on complying with the ongoing Energy transition.

In such a spectrum of collaboration, 1 PhD student and 1 member of TUC would gain insights and better understanding on practical aspects of such a field of study. The implementation of part of the doctoral dissertation in combination with traineeship are the activities of the PhD student during the proposed mobility of 6 months. TUC proposes 1 outgoing staff member of TUC for 1 month teaching at UKMO. Collaborating with a University, and generally with a country, of such an extensive experience on these fields, PhD and staff of TUC will be able to gain know-how, use new softwares and laboratories while also enhancing their academic profiles and research perspectives. UKMO proposes 3 mobilities for PhD students who will complete part of their thesis in combination with traineeship for a period of 6 months each and 2 outgoing staff members for 21 days teaching at TUC each. The 3 PhD students will have the chance to delve into analytical techniques and processes, useful for their research field, of the TUC while the academic staff will be given the opportunity to gain insights into the latter analyses, exchange knowledge and collaborate for environment- and exploration-oriented research.

Adherence to the principles of the Inter institutional Agreement and the required procedures before, during and after mobility have been pre-agreed in writing. Erasmus management officer and Inclusion Officer at UKMO: Mr. Alaeddine HAMMADI/Department of External Relations. Academic coordinator of Erasmus and legal representative of the agreement at UKMO: Prof. Mourad KORICHI/Vice-Rector for External Relations and Cooperation. Prof. Mourad KORICHI and Mr. Alaeddine HAMMADI have stated that they can co-supervise the dissertation of incoming student of TUC and they can contribute to the activities of the incoming staff of TUC for teaching. Academic coordinator of Erasmus program at MRED, Prof. Gotsis Alexandros can contribute to the activities of 3 incoming students. Prof. Nikos Pasadakis/ PVT & Core analysis Lab/MRED has stated that can co-supervise the dissertation of 3 incoming students. Dr. E. Antoniou/ PVT & Core analysis Lab/MRED has stated that can contribute to the activities of the 2 staff members from UKMO for teaching. Erasmus management officers of both Institutions have already been informed about the academic calendars. The recommended language skills for incoming participants at TUC are English/B2 and for UKMO are English/B2 or French B2. Evaluation criteria of students at UKMO are Academic merit, curriculum vitae and motivation to participate to the mobility. Criteria for evaluation of staff at UKMO are the teaching and research experience and the activity plan.

C. IMPACT AND DISSEMINATION

Ερώτημα C (Σε επίπεδο ιδρύματος/20βαθμοί)

The proposed plan will activate specific research contact between two Institutes with different countries, with differentiated academic but also social characteristics, bringing together researchers of two continents with different backgrounds creating opportunities of connecting not only research activity and

knowhow but also different work ethics. Through the procedure Greek and Algerian researchers will have the opportunity to access to one another's laboratories and work with various techniques and analytical instruments that will accelerate research results through economies of scale. TUC is a regional Greek Institution based in an island and on the other hand, University Kasdi Merbah-Ouargla is a regional Algerian Institution based in the heart of Sahara Desert, and this interplay is sure to lead to cutting edge research because of the important boost of motivation and opportunity to discover new ways of scientific thinking and studying of subjects that affect so differently the two regions concerning their characteristics and inputs towards environmental research. Such joint work will definitely have the strategic advantage for accelerating findings for a more equalized and sustainable path of energy transition. That will be extremely useful for the two countries and their people, as well as the environment of such different geographic conditions. The rationalization of the energy transition process and the redirection to green energy is crucial for both parts, because of the high rate of accumulation concerning the employment to fields like fossil fuels mining, and as so relevant research will uphold reduction of the social impact of the transition.

1) Impact for exchange students: Gaining hands-on experience on laboratory techniques and softwares and improving technical skills while enhancing knowledge on the field of interest is expected from the mobility program concerning the doctoral student mobility to the partner HEI. Going along, intercultural awareness will be established for students without previous experience abroad, giving them the opportunity to work with people with different cultural background and acquiring new skills not only technical but also communicative, empowering the student's self-confidence that would be crucial for future professional profile.

2) Impact for academic staff: Intercultural working groups of common research interest is believed an effective way to exchange not only knowhow but mainly to transform the way HEIs' staff think, while they work on a subject. This interaction empowers critical thinking and improves people characteristics and behaviors during team working. Knowledge generation for scientists requires getting out of "the comfort zones" and experiment to new ways of working and through such culture mix-up collaborations could lead to exponentially increased quality-wise results impact. Short term staff mobility that will be followed by a longer period of digital scientific interaction will help researchers to get used to new ways of working together, ameliorate digital communication culture and consolidate the contemporary -no borders included- work environment.

3) Impact for the Universities: TUC is constantly seeking on creating new scientific alliances with Technical Institutes of the world, especially when specific academic directions are alike, scoping to enable synergies that will expand its staff abilities and perspectives through fruitful working interactions. In this spectrum, the joint working period with Algerian colleagues (staff and students) will provide useful "tools" for both sides, but especially for TUC's side will create opportunities to work with scientists from a geographical area so close to Crete but at the same time with differences important enough to become an interesting mixture of people to work together under matters of global interest such as the transition to more neutral footprint types of energy, while having significant scientific background on studying fossil fuels. TUC through the ICM program will consolidate a linkage with UKMO that will provide a intercultural research opportunity window to an Institution with significant scientific presence on topics of common interest like mineral resources, while being located to a sub-Saharan region with hydrocarbon resources (increasingly exploited over the years) and associated infrastructure, that attract scientific interest. Moreover, the extroversion of the included students and academic staff, the fortification of their knowledge and know-how in the related research fields as well as the strengthening of the mobility attitude and culture in these departments, will expand the HEIs perspective of more future collaborations and further related research involving more partners.

4) For both countries: As Greece has a strategic plan on Energy transition, based on the usage of natural gas, such a collaboration could be proven propitious. This will be achieved in the sense that pertinent practices and knowledge will be shared with a country having a significant background in this very field of research. Thus, sharing the already gained knowledge of the exploration and exploitation of such energy sources as well as generating new insights on these, would definitely be proven beneficial for Greece and help comply with the ongoing Energy transition. Such a collaboration could be insightful in many interrelated ways. Cooperating with a neighboring country will assist in the establishment and enhancement of intercultural awareness. Providing the opportunity of collaboration between two countries of different continents, of people who speak different languages and different cultures will definitely promote awareness, enhance communication and embrace the importance of difference. In a more practical way, this collaboration will provide the opportunity to build new knowledge regarding the mentioned fields of interest. The scope is to develop innovative educational and research practices on the mitigation of fossil fuel exploitation impact on the environment, establish low risk CO₂ capture and storage technologies, and reduce the carbon footprint by creating a more environmentally responsible behavior. Additionally, the understanding, de-risking and environmental assessment of natural and biogenic gas plays in neighboring areas could provide energy safety in an efficient way to be studied, providing an area of strategic importance for Mediterranean, which could be proven beneficial for Greece to help her comply with the ongoing Energy transition.

5) International impact: The global strategy of enabling climate resilience through sustainable ways of producing energy, leaving aside fossil fuels is definitely not a direct procedure. The transition period acquires a closer focus on the ways fossil fuels will be a useful part of the global energy system and actions must be taken with the view on the future. The transition will transform the whole sector, by changing not only the materials and procedures that are so far used but also will define the equilibrium on an economic and social level. Going along with digital transformation, state-of-the-art techniques must be generated in order to manage carbon capture and storage technologies, eliminating the carbon footprint and chipping in the net zero strategy and promoting a more efficient and environmental friendly attitude. E-communication and collaboration which could once established will be used with different countries and collaborations around the world, decreasing the carbon footprint and at the same time creating a global e-community of energy researchers that will go one step forward to the transition target.

Measures for the dissemination of the results at the level of Institutions: Both Institutes are expected to produce critical insights through this collaboration concerning to proposed scientific field. By the end of the program period, important knowledge is expected to be ready to get published and promoted as part of both Schools identity, which will enhance their research position aiming to raise awareness of more students and researchers to embrace green energy issues for research and study, while acknowledging the two Institutions as beacons but also as means where such scientific engagement is taking place.

Measures for the dissemination of the results at the level of Countries: The generated insights of this ICM program between the HEIs of Greece and Algeria are expected to be crucial for energy transition matters, will be disseminated in every possible way, as significant findings need to be spread in order to enhance and promote not only important further scientific research on the related subjects by other research groups but also social awareness concerning energy transition targets and the wide global attempt towards them. Local, and national press will be on board for publishing the findings but also through the scientific papers that will come of this ICM program collaboration will be presented in national energy conferences of the post-program period.

Measures for the dissemination of the results at international level: Joint publications will come along this collaboration and the results will be announced at the International Meeting of Organic Geochemistry (IMOG) and further than that interesting scientific papers will be produced to published in international energy

scientific magazines and platforms, while the exchange will be the kick-off point of a long synergy on the resources management under the green energy transformation path.