

Integrated 0916							
RIF PROPOSAL NUMBER	TITLE	COORDINATOR	HOST ORGANISATION	PARTNER ORGANISATION	TOTAL BUDGET	RIF FUNDING	PUBLISHABLE SUMMARY
INTEGRATED/0916/0035	Empowering the Cyprus power system with sustainable and intelligent technologies	Kyriakides Elias	University of Cyprus	PA1: Cyprus Transmission System Operator PA2: ELECTRICITY AUTHORITY OF CYPRUS PA3: Phoebe Research and Innovation Ltd PA4: Cyprus Energy Regulatory Authority PA5: Deloitte Limited PA6: T.P. Aeolian Dynamics Ltd PA7: Cyprus Federation of Employers & Industrialists (OEB) PA8: Cyprus Energy Agency PA9: Ministry of Energy, Commerce, Industry and Tourism	1.234.577,00 €	1.000.000,00 €	EMPOWER brings together all the key stakeholders of the electric energy sector in Cyprus with an ambitious goal to develop sustainable and intelligent technologies and tools for the electric power system of Cyprus. The electric power system of Cyprus faces specific challenges due to its islanded nature. For example, there is a limit to the renewable energy capacity that can be installed without risking system instability. There is scarcity of reserves and reduced system flexibility. The system is often not capable of reacting adequately to large disturbances. On top of these, the cost of electricity in Cyprus is among the highest in Europe both for household and industrial consumers. A very crucial objective of this project is the installation of the required Phasor Measurement Units (PMUs) in order to make the transmission level of the Cyprus power system completely observable by solely synchronized and fast reporting measurements. Then, the EMPOWER platform, based on advanced and secure ICT technology, will be developed to enable the full exploitation of the capabilities offered by the modern measurement infrastructure. Several smart modules will be integrated within the platform for improving the monitoring abilities and control flexibilities for the system operator. Furthermore, the development of innovative methodologies for dynamic state estimation, load shedding, wide area control of storage and generators, and dynamic modeling will be important objectives of this project. EMPOWER will also focus on storage solutions that are adequate for the islanded case of Cyprus in order to improve the power system stability and extend the penetration of RES in the energy mix of Cyprus. It is envisioned that the project will result to great socio-economic benefits by improving the quality of life in Cyprus and by boosting the economy of the island to overcome the economic crisis.
INTEGRATED/0916/0063	Sea Traffic Management in the Eastern Mediterranean	Michalis Michaelidis	Cyprus University of Technology	PA1: Cyprus Ports Authority PA2: CYPRUS SHIPPING ASSOCIATION PA3: Tototheo Trading Ltd PA4: A.T. Delevant Business Solutions Ltd PA5: CYPRUS SUBSEA CONSULTING AND SERVICES C.S.C.S. LIMITED	1.022.882,00 € *	888.890,00 € *	The general objective of the STEAM (Sea Traffic management in the Eastern Mediterranean) project is the efficient management of sea traffic in the Eastern Mediterranean sea, while at the same time ensuring safety and environmental sustainability. Towards this end, the ports of Cyprus, and especially the Port of Limassol will have a vital role to play due to its strategic location, as an information hub, exchanging information with both nearby ports and ships in the Eastern Mediterranean area for optimizing the ships' routes and avoiding possible dangers. Moreover, the geographical location of Cyprus encourages the use of Cyprus ports as transshipment hubs for short sea shipping. This project will be based on the foundations laid out by the EU Sea Traffic Management (STM) Validation Project, in which the concept of STM (conceived in the EU MONALISA Projects) is currently being validated in 13 ports of Europe, one of which is the Port of Limassol. In the STEAM project, we plan to significantly extend and enhance the successful implementation of the STM concept at the Port of Limassol through the development of the Port Collaborative Decision Making Platform, which will enable real-time situation awareness to all participants involved in maritime activities in the ports of Cyprus. Furthermore, the Limassol Shore Center will be established to act as a communication hub in the Eastern Mediterranean region and provide various services to ships in order to optimize sea traffic and facilitate short sea shipping in the region. Moreover, the Port of Limassol will be modernized with innovative technological solutions and advanced data analytics providing new decision-support tools and services for maritime stakeholders. Through the STEAM project, we aim to establish Cyprus, as a nation, and the Eastern Mediterranean region as the showcase of STM for the world.
INTEGRATED/0916/0049	The effects of soil expansion/shrinkage on building foundations and their mitigation	Dimitrios Loukidis	University of Cyprus	PA1: Themelotechniki Eteria (Polys Argyrides) LTD PA2: Ministry of Agriculture, Rural Development and Environment PA3: Scientific Technical Chamber of Cyprus (ETEK)	435.660,00 €	377.835,00 €	Expansive soils are responsible for tens of billion euros of annual worldwide damage cost. Soil expansion due to wetting and contraction upon drying cause various types and degrees of damage to buildings founded on expansive soils. Expansive soils can be found in many regions of the island of Cyprus but, most importantly, in major parts of the urban centers. Designing buildings founded on expansive soils still relies largely on empiricism, with little analytical basis on the actual physics and mechanics governing such soils. As a consequence, uncertainties are inherently very large and design failures are quite common in many places in the world, including Cyprus. The goal of the proposed study is the development of optimal and sustainable foundation design and construction methods for buildings on expansive soils. The project involves field instrumentation, laboratory experimental work and numerical simulations. Existing and under construction buildings founded on the highly expansive soil called Nicosia marl will be fitted with sensors monitoring their response to seasonal moisture-induced soil volume changes. In addition, stations of in-situ measurements of soil moisture, porewater suction and soil expansion will be installed at the sites of the instrumented structures. The project also includes a comprehensive experimental program of lab tests for the determination physical and mechanical properties of the Nicosia marl. Based on the field and experimental data, numerical models will be set up for the thorough investigation of the expansive soil - foundation interaction. Series of parametric numerical simulations will be performed in order to reveal which among the existing foundation solutions are more suitable for the geologic and climatic conditions of Cyprus and which are ineffective. Based on the results of the numerical simulations, simple foundation analysis methods suitable for direct implementation in common engineering practice will be developed.

INTEGRATED/0916/0004	Novel integrated approach for seismic and energy upgrading of existing buildings	Christis Chrysostomou	Cyprus University of Technology	PA1: University of Cyprus PA2: Frederick Research Center PA3: TSIRCON CO. LTD PA4: Geoinvest Ltd PA5: T.C. Geomatic Ltd PA6: Limassol Municipality PA7: Ministry of Interior PA8: Ministry of Energy, Commerce, Industry and Tourism PA9: Scientific Technical Chamber of Cyprus (ETEK)	1.145.921,00 €	996.349,10 €	The majority of the existing building stock in Mediterranean countries suffers from two major deficiencies, the lack of seismic resistance and the poor energy efficiency. Given that buildings in this region suffer frequently from moderate destructive seismic events but also from high temperatures for a large portion of the calendar year, it becomes a necessity to proceed with upgrading measures. These measures are expected to increase the life expectancy of the existing building stock in an economically feasible way, but also to contribute to the sustainability of the society and the environment. Current practice promoted by the industry and adopted by governmental authorities evolves around upgrading solutions that isolate each deficiency and proposes solutions to enhance each of the two separately. In the last few years, from a sustainability perspective, emphasis is placed on developing an integrated structural and energy upgrading methodology for buildings that should be preferred over individual actions. This will provide a holistic view of the alternative constructive solutions using a performance based approach where the performance (improvement is quantified by monetary terms) will be judged not only on structural issues but also on environmental parameters including energy efficiency. In order to fulfill the above, the objectives of the Project entitled "Novel integrated approach for Seismic and Energy upgrading of existing Buildings" (SupERE) are set to a) integrate innovative materials and determine techniques enabling the simultaneous upgrading of both seismic resistance and energy efficiency of existing buildings, b) evaluate these techniques by testing both small and full-scale specimens, and c) propose a holistic and novel methodology for the optimum upgrading of existing buildings for seismic resistance and energy efficiency, taking into account economic, technical, geo-location, durability and environmental factors.
INTEGRATED/0916/0050	DC Corrosion Blind Spots Inherent to Photovoltaic Systems' Operation and Undetected Faults - Trojan horse for Deteriorating the Integrity of Critical Infrastructures and Buildings	Charalambos A. Charalambous	University of Cyprus	PA1: Cyprus University of Technology PA2: NORTEST (CYPRUS) LTD PA3: Ecoenergia Cyprus Ltd PA4: HELLENIC COPPER MINES LTD PA5: Ministry of Transport, Communications and Works PA6: Syndesmos Adeioouxon Ergolipton Hlektrologon Kyprou (SEHK)	918.846,00 €	811.476,00 € *	The proposed project investigates, quantifies and provides mitigation suggestions for a novel issue that pertains in addressing: a)The impact of accelerated dc corrosion on critical infrastructures, such natural gas pipelines and oil tanks that are operated near large-scale Photovoltaic plants. b)The impact of accelerated dc corrosion on the envelope and metallic infrastructure of energy efficient buildings that benefit from Building-Applied Photovoltaic Systems (BAPVs) and Building-Integrated Photovoltaic systems (BIPVs). This accelerated dc corrosion issue arises due to direct current (dc) leakage detection blind-spots, inherent to PV systems' operational and dc fault detection mechanisms. The blind-spots are inherent to the existing thresholds for allowable dc leakage (emanating from PV systems) which have been so far based on other issues such as fire or personnel safety. However, the level of allowable dc leakage from PV systems can be high enough to cause accelerated dc corrosion on nearby critical infrastructures and on buildings. This allowable dc leakage can effectively act as the Trojan horse when it comes to a cost-effectively maintaining the reliability and integrity of structural buildings and critical metallic infrastructure. Thus, this project will provide valuable insights that can be used in the Sustainable Planning and Management of Buildings and Infrastructures construction.
INTEGRATED/0916/0020	EnterCY: ENhancing Tourist ExpeRience in Cyprus - An integrated platform for promoting Cyprus	Harris Papadopoulos	Frederick Research Center	PA1: University of Cyprus PA2: CY.R.I.C CYPRUS RESEARCH AND INNOVATION CENTER LTD PA3: SILVERSKY3D VR TECHNOLOGIES LTD PA4: IMH C.S.C Limited PA5: Cyprus Tourist Guides Association PA6: Association of Cyprus Travel Agents PA7: Ministry of Transport, Communications and Works PA8: Deputy Ministry of Tourism	1.230.159,20 € *	998.107,20 € *	According to the Smart Specialization Strategy for Cyprus (S3CY), the tourism sector is considered as the "spearhead" for the economic development of Cyprus having a significant contribution to the national Gross Domestic Product. S3CY experts, however, pointed out that the traditional "Sea and Sun" tourism development model is obsolete and there is an urgent need for new strategic models for attracting new forms of tourism. They have argued that it is important to direct the focus from quantitative tourism to qualitative and consequently sustainable tourism. One step towards this direction is the promotion of alternative tourism by informing potential tourists about Cyprus' Mediterranean flavour that combines nature, history, culture, a variety of activities and leisure, as well as the enhancement of tourists' experience and satisfaction, before, during and after their visit. The EnterCY project aims at developing an integrated virtual and augmented reality platform utilizing cutting-edge Information and Communication Technologies for promoting Cyprus as an attractive destination by (a) informing potential visitors about the rich cultural heritage, variety of activities and wealth of sightseeing locations of Cyprus through a spatio-temporal virtual exploration before their visit, (b) enhancing tourists experience and satisfaction by providing visual and audio guidance, navigation, as well as entertaining and learning by storytelling through augmented reality with location-awareness during their visit in both indoor and outdoor sites, (c) offering an after visit experience through immersive reality technologies, by providing tourists with a personal 360 video of their on-site tour after their visit as a memento and (d) allowing tourists to share their experience in real-time through the platform integration with social media. In all stages of the EnterCY platform, personalization will be employed for presenting the tourists with information and suggestions tailored to their personal interests and needs.
INTEGRATED/0916/0029	Face to Face: Meet an Ancient Cypriot	Kirsi Lorentz	The Cyprus Institute	PA1: Ministry of Transport, Communications and Works PA2: Deputy Ministry of Tourism PA3: Association of Cyprus Travel Agents PA4: Association of Cyprus Tourist Enterprises Ltd PA5: DEVELOPMENT AGENCY OF LEMESOS LTD PA6: Vlasides Winery Ltd PA7: Pestle and Mortar company Ltd PA8: Halotox Ltd PA9: SE STUDIO CERAMICS WORKSHOPS PA10: Cyprus University of Technology PA11: Top Kinisis Travel Public Ltd PA12: G. PH. IOANNIDES LTD	1.188.714,05 € *	999.998,17 € *	Recent studies have highlighted the impact of global economic crises on Cyprus tourism: lack of competitiveness, inadequate quality, and escalated pricing. Policy measures to grapple with these undesired and economically devastating developments include immediate response measures, foreign investment in tourism, and diversification of the tourism product and quality improvement. This proposal addresses the third of these measures, i.e. diversification of the tourism product and quality improvement. Our aim is to assist the tourism industry and the stakeholders involved, through translation of scientific research results (osteobiographies of ancient Cypriot individuals) into prototypes of tourism products, so that Cyprus can enjoy a significant competitive advantage that will help strengthen its economy. This overall aim of the proposal is addressed through increasing the appeal and accessibility of cultural heritage for tourism through encounters with real individuals from the Cypriot past, based on bioarchaeological research leading to construction of osteobiographies. The project involves an integrated intervention (involving the quadruple helix of academia, enterprises, governmental services and policy makers, and societal stakeholders) through research, technological and innovation activities for addressing important challenges in the tourism sector (i.e. its diversification; quality improvement); and the creation of concrete prototype tourism products with a real impact in economic development. Further, this proposal contributes towards the development of comprehensive tourism planning networks, particularly in the domain of special interest tourism based on cultural heritage. Such networks are called for in recent studies of the Cyprus tourism sector. The project also involves the development of branding, market profiles, segmentation and positioning strategies for ancient life stories-based tourism, and GIS and Mobile Augmented Reality for promoting it.

INTEGRATED/0916/0019	Carobs, the Black Gold of Cyprus: science meets industry	Andreas Constantinou	University of Cyprus	PA1: Ministry of Agriculture, Rural Development and Environment PA2: MINISTRY OF HEALTH PA3: RTD Talos Ltd PA4: CO-OPERATIVE CAROB MARKETING FEDERATION LTD PA5: SODAP LTD PA6: POLYXENIS CAROB PRODUCTS LTD PA7: assia mare ltd	1.118.201,60 € *	999.232,76 € *	Carobs in Cyprus has traditionally earned the name of Black Gold. For decades it was one of the main economic sectors of the country. Recently, the international market for carob-based products has increased mainly due to the significant rise in the demand for biologically natural, gluten and caffeine free products but also because of other factors, such as the expected shortage of cacao and the beneficial effect of carobs on gastrointestinal disorders. This projects aims to play a significant role in evolving and re-establishing the carob industry of Cyprus into a modern form. Through a wide ranging scientific investigation of the Cypriots carobs, the project aims to uncover their key biochemical properties that can form the basis for the production of novel carob-based products and identifying the parameters that could improve the productivity of carob trees in Cyprus. To ensure the commercial viability of these new types of carob products the project includes several activities to monitor the development of the various sectors of the international markets for carob-based products. In particular, the project aims to produce the following results: 1) comprehensive genetic profile of Cypriot carobs, 2) in-depth analysis of their chemical composition and bioactive/health promoting properties, 3) new scientifically based cultivation guidelines for the agriculture of carobs in Cyprus and, 4) a wide collection of (types of) commercially viable Cypriot carob-based products. The strong synthesis of this inter-disciplinary work of the project involving scientific, industrial and commercialization, aims to achieve a thorough understanding of the long-term potential of the carob industry in Cyprus and offers a unique opportunity to elevate the carob industry in Cyprus and expand its novel and traditional products to the global markets.
INTEGRATED/0916/0061	Proactive Producer and Processor Networks for Troodos Mountains Agriculture	Adriana Bruggeman	The Cyprus Institute	PA1: Ministry of Agriculture, Rural Development and Environment PA2: A.M. FILAGROTIKISYMMVOULEFTIKI LTD PA3: TROODOS DEVELOPMENT COMPANY PA4: Niki Agathokleous LTD PA5: Architextonikes kai Perivallontikes Meletes LTD PA6: SYNDEMOS VIOKALLIERGITON KYROU (COFA) PA7: Euroagrotikos PA8: SIGINT SOLUTIONS LIMITED	674.387,60 € *	577.251,80 € *	The agro-food sector in Cyprus has a high but unexploited potential. This is even more so in the Troodos Mountains, which cover the central part of the island, and is the key production area for deciduous fruits and nuts. Rural migration and the high production costs of the terraced land cause a steady decline in agricultural production in the mountains. Water is also a key limiting factor for agriculture in this semi-arid Mediterranean climate, a problem that is amplified by climate change. Thus, it is even more important for Cyprus to maintain agriculture in these cooler mountain environments. A consortium of local producers, processors, small enterprises, social organizations and researchers have joint hands with the aim to strengthen the viability and profitability of mountain agriculture. The goal of the 3PRO-TROODOS project is to improve agricultural production and food processing in the Troodos Mountains of Cyprus, through social innovation, sustainable natural resource management and climate change adaptation. The project aims (a) to develop a voluntary Troodos quality certification label through a fully participatory process; (b) to improve processing through innovation and linkages between producers and processors; (c) to quantify current and future irrigation water demands based on high-resolution climate projections (2020-2050); (d) to develop guidelines for sustainable irrigation; (e) to test four climate resilient innovations with pilot farmer groups; (f) to analyze the cost and benefit of tested innovations and the socio-economic impacts of the quality certification label through input-output modelling. The 3PRO-TROODOS consortium is convinced that through the integration of people, scientific and practical knowledge and experiences, they can add value to farming, make agriculture climate resilient and sustain the beautiful cultural landscapes of the Troodos Mountains in Cyprus.
INTEGRATED/0916/0016	Air Quality Services for a cleaner air in Cyprus	Jean Sciare	The Cyprus Institute	PA1: Cyprus University of Technology PA2: E.U.C. Research Centre Ltd PA3: MINISTRY OF LABOUR, WELFARE AND SOCIAL INSURANCE PA4: Ministry of Agriculture, Rural Development and Environment PA5: ADITESS ADVANCED INTEGRATED TECHNOLOGYSOLUTIONS & SERVICES LTD PA6: Cyprus Safety and Health Organisation	1.119.012,00 € *	999.994,20 € *	Cyprus is a central location of the Eastern Mediterranean and Middle East, a region with a very high anthropogenic pressure (population of about 400 million) affected by dust storms, dryness, heat extremes and unparalleled air pollution. Air pollution, and more particularly particulate matter (PM), plays here a crucial role in regional climate (temperature, precipitation) and has also major adverse health effects. Approximately 400 premature deaths and 8,000 years of life lost per year are attributable to PM in Cyprus. This will have considerable environmental, economic and health impacts that need to be assessed in order to implement efficient national mitigation strategies. The AQ-SERVE (Air Quality Services for a cleaner air in Cyprus) project will combine new technical developments (Unmanned Aerial Vehicle and cost-effective miniaturized atmospheric sensors) with new scientific knowledge (characterization/prediction of air pollution) in order to develop and validate the first national Air Quality model platform with forecasting capacities. This model will serve the public authorities to better adapt during extreme events (dust, smog, industrial hazards). Different (abatement) scenarios will be tested in order to define efficient mitigation measures which can be put into practice in the framework of the National Air Quality Action Plan. Quantitative evaluation of the health impacts and risk assessment of air pollution in Cyprus will also be addressed for the first time (air pollution exposure map, impact of AQ scenarios on health including cost benefit analysis). AQ-SERVE will form the basic tool for carrying out research projects related to Environmental Health and therefore address both the relevant subtopics "Environment" (transverse priority) and "Health" (Promoting of Public Health and Quality of Life; Diagnosis - Prevention / Risk Factors / Exposure to environmental factors) targeted by the Smart Specialisation Strategy of Cyprus with implications in other priority sectors (Tourism, Energy, Transport).