



RESEARCH AND PROJECT DEVELOPMENT DIRECTORATE (ARPROGED)
OKAN UNIVERSITY TECHNOLOGY TRANSFER OFFICE

THEMATIC EXCELLENCE CENTER AND CLUSTER
INTELLIGENT AND GREEN VEHICLE TECHNOLOGIES
CENTER OF EXCELLENCE

CASE STUDY

GOOD PRACTICE FOR TTO'S

12 OCTOBER 2017

“Thematic Excellence Center and Cluster” strategy integrated with international center of excellences to support innovative and cutting edge technology development and transfer intelligent and electrified vehicle technologies excellence center (e-Hike).

The Essence of Good Practice

To create research and clustering infrastructure to enhance the collaboration of university and industry stakeholders within the “Thematic Excellence Center and Cluster”, multidisciplinary research and open innovation methods enable our country to take place in the global economy with high added value, technology and knowledge intensive products and services of the automotive sector and SMEs, such as intelligent and electrified vehicles which is an area considered to be disrupting for automotive sector. To create multidisciplinary, scientific, technological and innovative networks and interfaces that will contribute to the establishment of an economic structure focused on innovation and creativity, and in this direction will contribute to the development of innovative companies, related sector firms and SMEs, increasing the capacity of creativity and developing innovative technologies sustainably.

Introduction

Okan University with its vision of innovative and leading “World University” to respond to industry and business needs in international standards, aims not only to create know-how and also implements and turn to commercial value in the pathway to become a 4th generation university. Okan University, promotes the new technologies and inventions with a mission of conducting research which is beneficial for the society and leverage the quality of life.

Research And Project Development Directorate - ARPROGED, which is defined as the Okan University's "Technology Transfer Office", lead the commercializing process of technology based knowledge and support technology transfer and entrepreneurship. In this point ARPROGED becomes university-industry interface, aims to facilitate transferring the knowledge to the industry and commercialize the added value.

During the transferring the technology to the industrial companies the main problem is the lack of the multi-disciplinary, multi-partner innovative and advanced technology creating concept and physical areas to determine the need of the firms and finding the suitable industrial partner. To solve this problem, the main strategy of ARPROGED for the technology transfer process is creating and establishing "Thematic Excellence Center and Cluster" to identify major research areas on future trends and regional problems, to conduct advanced technological research together with the leading industry and forming clusters in those areas and to collaborate with national and international center of excellence in order to conduct researches worldwide.

Methods of the Practice

"Thematic Excellence Center and Cluster" concept is a good practice for Industry/University Collaborations and also an example for TTO's to foster commercialization of a selected research areas of the universities to support the research portfolio sharing with the suitable company.

This method help to establish continuous collaboration ecosystems creating research and inovation based technology development and transfer culture through by integrating different kind of disciplines.

Key technology area of Okan University is Intelligent Vehicle Technologies with “Transport Technologies and Intelligent Automotive Systems Research and Development Center-TTIS” formed in year 2009. To select the right area for Excellence and Cluster Center, the following criteria have been considered,

- a) In National Development Plan and in Science and Technology Higher Level Council presentations “Automotive Sector” was selected as one of the important sectors in Turkey and Intelligent and Electrified Vehicle Technologies were recognized as disruptive Technologies for the sector. There were no Excellence Center in Turkey on the related field.
- b) This area was recognised as also a very important research area due to environment, safety and societal needs in Europe and in the World. There were many associations in Europe like ERTICO, EGVA and EU research framework programmes had always a good research budget and intensive research activity on the field.
- c) The area is very much interdisciplinary including different branches of engineering in line with other disciplines, such as medicine, psychology, sociology, marketing etc.
- d) Number of academicians who can contribute the field

Target groups covers the automotive OEM’s, automotive supplier companies, universities, research centers, related SME’s and Automotive Technology Platform. And the objective of the “Thematic Excellence Center and Cluster” is creating a model for accelerating promising research to the point of commercialization to increase the innovation and technological capacity of industrial partners helping to promote their economic growth.

“Intelligent and Green Vehicle Technologies Center of Excellence” is an umbrella structure which comprises excellence center and cluster. The steering committee of the center is formed including the members from the industrial stakeholders. The model is shown in Figure 1.

Transportation Technologies and Intelligent Automotive Systems Application and Research Center (TTIS) is established to develop the academic and technological knowledge required by the Turkish automotive industry, automotive supplier industry and public by doing foresight studies on future transportation systems and vehicles that work on clean energy, intelligent vehicles, intelligent transportation systems, unmanned vehicles, robots and robot groups and their modeling, simulation, design and realization.

"Sustainable, Innovative Electrical and Hybrid Vehicle Technology Development and Cluster Center" and "Innovative Intelligent and Communication Vehicle Technologies Development and Cluster Center" are established by using the Istanbul Development Agency funds

Through these clusters and the research center, there are significant contributions to the development of innovative products and services in the region, in the country and also in EU level. These clusters are planned to include academicians and industrial partners from other universities specialized in the automotive field to further increase the academic level and create synergy.

These centers will also allow interdisciplinary research activities within the university. It will be ensured that the academicians who will come together will have the opportunity to work together.

“Intelligent and Green Vehicle Technologies Center of Excellence” objectives are determined as follows;

- Developing globally competitive products and services
- Contributing to the automotive market through in a vehicle with an innovative green and intelligent vehicle and related technologies. Investigate strategies to develop a sustainable green and innovative vehicle ecosystem and related technologies
- Develop innovative technologies
- Help support to increase of sales and exports



Figure 1. Model for Creation of Excellence Centers and Clusters Researching World-Wide in Selected Critical Fields

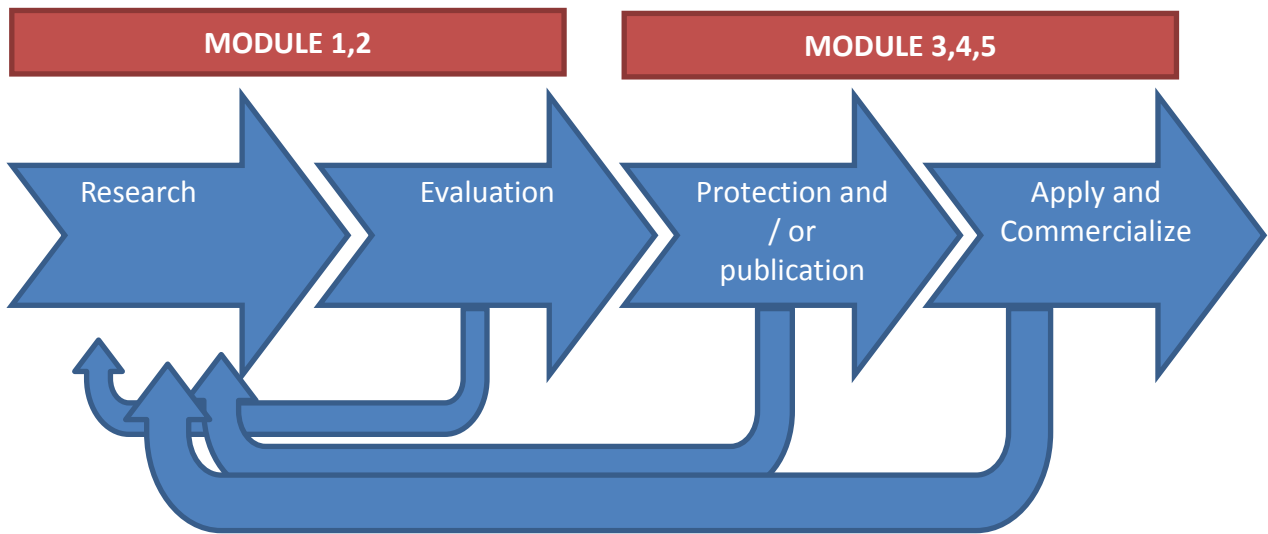


Figure 2. ARPROGED Technology Transfer Process

Center of Excellence Systematics

Case Study – Intelligent and Green Vehicles Interdisciplinary Study

In order to increase the research capacity of Okan University, the "Thematic Excellence Center and Cluster" strategy was first applied to vehicle technology and the concept of "Intelligent and Green Vehicle Technologies Center of Excellence" was established. The foundation of the Center of Excellence was realized according to the establishment of "Sustainable, Innovative Electric and Hybrid Vehicles Technology Development and Cluster Center" in 2014 and "Innovative Smart and Communicative Vehicle Technology Development and Cluster Center" in 2015 with the support TAYSAD, TESİD and YASAD, funding from Istanbul Development Agency (İSTKA). Many activities related to university-industry co-operation have been carried out in the E-Hike and E-Hikelink clusters established by the work of these two centers. These activities included information on cluster members, innovative ideas development workshops, and

innovative idea conferences. As a result of all the activities, research projects have been developed with close to 50 cluster member solution partners and applications to both national and international funds have been realized. This Center and Cluster also help support ARPROGED Technology Transfer Process (Figure 2).

E-Hike and E-Hikelink cluster stakeholders include the private sector, public institutions, universities, non-governmental organizations, research centers, techno-parks, organized industrial zones and technology platforms. Inter-disciplinary projects have been developed since 2014 for funding applications for both academic and industrial support through collaborative efforts with solution partners.

National and international grant application applications have been made with automobile companies such as Tofaş, Ford Otosan and Otokar, which are among the leading companies of TURKEY, and also they are E-Hike and E-Hikelink cluster members. In 2015 and 2016, project partnerships were established in national and international grant projects with Otokar, Tofaş, Ford Otosan, Altinay, Figes, Tırsan, Hema, Fev, Pavo, Koç Bilgi ve Savunma, Farplas, Karsan, Assan Hanil, Acmena, İETT, Turkcell, Isbak, Fraunhofer and Itizzimo and 21 TUBITAK Projects submitted and 5 of them are accepted from academic funds. 3 TÜBİTAK 1505 project applications were made under business/industry funds. And also lots of consultancy project are determined, on going and waiting the evaluation results.

In this process, 1 Transportation Ministry of Maritime Affairs and Communications Project and 2 Ministry of Science, Industry and Technology, Competitive Sectors Programme are submitted.

Among the European technology platforms, ERTICO and EGVA memberships, the most powerful organizations in the field of "Mobility and Green Transport", have created

opportunities to participate in international projects in Turkey as well as in Okan University. Clustering and excellence centering efforts have also increased the possibility of developing new ideas for pre-competition cooperation. Extension of these studies with foreign relations has provided significant potential for new project opportunities.

A protocol has been drawn up to cooperate with the Regensburg e-mobility cluster. In this way, relations with the automotive cluster in France have been improved, and HORIZON 2020 project preparation work has been carried out.

Through collaborations developed with international technology platforms, Okan University has partnered easily within the H2020 project consortiums in the smart, green and integrated transport call. Within two years 5 H2020 project were submitted and also Turkish Partners were involved in these projects through Okan University.

Horizon 2020 Projects

- Collaborative Tools for Sustainable City Mobility (X-City)
- ✓ **Optimal Fuel Consumption with Predictive Powertrain Control And Calibration for Intelligent Truck (OptiTruck)**
- Sustainable Advanced Battery Value Chain Revolution for Electromobility (SABRE)
- Innovative and Sustainable Battery Pack Development for Increased Efficiency and Energy Density (INNOBATT)
- Sustainable Advanced Battery Value Chain for Electromobility Revolution (SABER)

In this framework, the "OptiTruck" project, which was applied to the H2020 program in 2015, was accepted in 2016. 1/3 of the total budget of this project belongs to Ford Otosan with Okan University and this ratio has been a success story at TUBITAK. The membership of ERTICO and ARPROGED play an important role in the formation and preparation of this project. Like Ford Otosan, other companies in these projects can provide targets to increase their sales and export figures by participating in vehicle market by developing global competitive and technological products and services.

ARPROGED has been a significant contributor to the preparation of HORIZON 2020 projects. In INNOBATT project, Okan University became the Coordinator and project application was made as a coordinator by bringing together major research centers in Europe and also by including two other companies from Turkey. For this reason, cluster activities within the Centers of Excellence are a very effective way to increase the amount of funds transferred to the University, both in terms of project numbers and having large budgets in national and international project applications and give also important support to innovation ecosystem of the region.

The preparations for the new H2020 projects with the member organizations are ongoing.

Lessons Learnt

During the implementation of the Center of Excellence strategy in Okan University, learned experiences by Technology Transfer Office are listed below;

- By concentrating on a specific field with an existing core group and related industrial partners, it is possible to achieve more effective results.

- To understand the needs of the cooperating industrial organizations very well.
- By introducing interdisciplinary work, more innovative solutions could be achieved
- Selecting the right research and technology development area through right strategies is vital.
- Technology Transfer Office has to be always proactive.
- Managing pipeline affectively with open innovation to increase the potential of the new developments and contribute to the transfer of the future income to the equipment and personnel infrastructure.
- To support financial sustainability by increasing patent and license revenue.

Financial

The sources for funding the TTIS are basically as follows,

- Development Agency Funds
- Okan University Funds
- ARDEB Projects (National)
- TEYDEB Projects (National)
- HORIZON 2020 projects
- Industry projects

The sources are to be diversified through other possible related calls and agencies.

Conclusion

“Intelligent and Green Vehicle Technologies Center of Excellence” is considered as a “good practice” example because of the criterias listed below:

- To provide a physical place to bring all the collaborators together.
- To contribute to the development of research and innovation culture.
- To enable interdisciplinary studies and strengthen university industry cooperation.
- To increase the research project capacity as the result of university industry cooperation.
- To ensure that innovative and competitive technologies emerge as a result of research projects.
- To facilitate the transfer of innovative and competitive technologies to the industry.

Okan University Intelligent and Green Vehicle Technologies Center of Excellence is the first center in our country to be established in this area. It is an example of the application of the innovative approach to other fields in terms of future visibility. It was the first in the center's field and enabled it to create an important infrastructure on the grounds of benefiting from government support. Both the equipment and the academic expert infrastructure are shown as a reference for our country. In the field of automotive, not only national but also international institutions and organizations have become partners to establish cooperation. The most important feature of Okan University that distinguishes itself from other excellent centers established with the support of Technology Transfer is its pioneering approach in the automotive sector.

It is an example for other Technology Transfer Centers based on cooperative, pioneering, innovative and entrepreneurial approach and also a good practice applicable to different research areas.

To be sustainable in the long run, the information and technology intensive products and processes need to be developed at the Okan University Intelligent and Green Vehicle Technologies Center of Excellence. The greater the number of innovative products and processes transferred to the industry, the greater the number of collaborating partners benefiting from these technologies. Strengthening cooperation within the win-win system will increase the joint project activities and consequently contribute to financial sustainability especially with the increase of fund resources.