



EVALUATION OF HORIZON'2020 and EFFECTS ON PUBLIC TRANSPORT

Büşra Boysan, (MSc)

Istanbul Commerce University, Turkey

İsmail Ekmekçi, (PhD)

Istanbul Commerce University, Turkey

Abstract:

European Union Frame Programs is a research program with one of highest budget in the world. It operates for the purpose of the improving research and technology, to promote university-industry cooperation, creating mutual and powerful sources, providing human resources and to support international cooperation. It provides support with a specially established fund. In Turkey, European Union Programs coordination is done over TUBITAK. TUBITAK, aside from undertaking the job of being a coordinator for constituting international consortiums, it also promotes participation with various support and rewards. In this article, encouraging participation to European Union projects in order to move R&D activities in Turkey to a universal level, general overview will be provided to this process in order to be able to benefit from this effectively. In the direction of this general overview, world trends will be examined under Horizon 2020 headings while discussing the subject of transportation. Especially on the subjects of energy efficiency, smart cities, integrated transportation, effects of projects that are applied or aimed in the world on transportation will be examined. Near future of the transportation sector will be discussed and different models that can be adapted to Istanbul will be evaluated. Transportation potential that will be examined under these headings supported by Horizon 2020 is a pre-promotion to creating consortiums countrywide.

Keywords:

European Union Projects, Horizon 2020, Support Programs, Consortium, Public Transport, Energy Efficiency on Transport, Smart Cities and Transportation, Integrated Public Transport, Projects with Potential on Transportation, Horizon 2020 and Transportation

1. Introduction

The concept where technological and social innovations force the World trend: Universalization. Based on this concept, sustainability and propagation of the projects gain importance and concepts of international collaborations, technological transfers, adaptation and integration come to the forefront. For the regional development agencies to be functional and for them to actualize the objectives expected of them, existence of the variables listed below is absolutely necessary (Kayasü et al, 2003:9):

- Enough population size
- Culture and Infrastructure for Entrepreneurship
- Existence or constitution of qualified workforce
- Determining regional development strategies
- Existence of convenient sectors for development

In a region hosting these factors, strategic ventures of the regional development agencies are gathered in five main groups (Hughes 1998:620).

- Providing financial assistance or support
- Uncovering new investment fields
- Doing consultancy for SME (Small and Medium Sized Enterprises)
- Determining development objectives for the region in the long term.
- Contributing to developments in social fields

As emphasized by these studies, purpose of regional support programs is, from transportation to technology, from infrastructure to human resources, pioneering in terms of innovation transfer in various fields.

Studies to establish international collaborations also bring the need for coordination with it. European Union Frame Programs, while carrying out this coordination mission, provides financial support for these innovative applications to come to life. For Turkey to play a part in these projects, while also helping to open up the horizon for establishing technology, this trend can be caught as technological improvements applied on projects in Europe are adapted to our country.

Industry organizations, SME's, SME Unions, Universities, Research Institutes, Research Centres, Public Organizations, Civil Society Organizations, International Organizations, individual researchers can all participate to the study within the scope of Horizon'2020.

Having close up relations and developing mutual projects with universities in the region and other educational establishments is also within the objectives of regional development agencies. As a result of the collaborating with the universities for the purpose of actualizing the regional development, doing analysis that will provide not only directing economic, social, technologic structure of the regions, but also revealing stronger and weaker sides of the region and giving the possibility to scrutinize the threats is going to be of utmost importance (Goddard and Chatterton 1999:685-699).

In this context, various support organizations have started within the universities. In Istanbul Commerce University, May 2004, it was established to contribute in informing public and improving Turkey-European Union relations with an interdisciplinary approach by means of developing research and application projects on the subjects of law, politics, economics and social at the process of Turkey's full membership to European Union. By establishing many university-public, university-private sector-SME collaborations, technical and R&D capacities of the universities are evaluated within the scope of the project.

2. Evaluation of 6th and 7th Frame Programs and Transferred Classes

Total budget of the 6th Frame Program within the years of 2002-2006 that took 5 years was prepared as 17,5 billion Euro. 7th Frame Program which lasted 7 years had a prepared total budged of 53,2 billion Euro. For the project planned to be between the years 2014-2020 with the duration of 7 years, reserved budget is announced to be 71 Billion Euro.

Turkey, after the acquired learning process during the 6th FP, drew a rising graphic at 7th FP with the applied correct strategies on the basis of participated projects. However, due to some structural issues, Turkey was under the potential that it could show during the program. These types of structural issues can be divided into two groups which are namely; Issues about the functioning of 7th FP and problems related to Internal functioning of Turkey as a whole. Examples for issues related to the program could be rooted structuring and Turkey having difficulties being included in this program, too much competition with two few projects, not giving space for Turkey or its associated countries on certain calls etc. For problems related to internal functioning of Turkey as a whole, lack of experience and awareness, weak collaboration culture, Insufficient R&D for the private sector could be shown as examples.

In these programs; not being able to complete certain R&D activities that are being conducted in university and research centres, project output taking too long to enter into the market, innovation not being reflected on activities as expected, business expenditure ratios added to direct expenses and gift ratios being different for work packages and many gift programs, tight financial reporting and accounting inspection mechanism, lack of resources for SME's and problems within warranty-risk capital has been seen. In addition to this, lack of coordination between Europe Innovation and Technology Institute (EIT) and Competitiveness and Innovation program (CIP) related to R&D and innovation activities at 7th FP applied separately also caused resources to not to be used efficiently (Bağrıaçık, A., 2014).

According to these evaluations, for projects that will be supported at Horizon'2020, projects with its material outputs with wide range of fields to use have gained importance. Sustainability of the technologies developed after the projects, is considered to be one of the most important evaluation criteria amongst the prepared projects.

3. Title, Subtitles for Horizon'2020 and Reserved Budgets

3.1. Societal Challenges

Total budget of the program: 30 billion €s.

- Healthy, active aging and welfare
- Food security, sustainable agriculture and bio economy
- Safe, clean and efficient energy
- Smart, clean and integrated transportation
- Increasing climate change and resource efficiency
- Inclusionary, innovative and safe societies

3.2. Industrial Leadership

Total budget of the program: 17 billion €s.

- Leadership amongst Simplifying and Industrial Technologies field
- Accessing Venture Capital
- New Research Program for SME

3.3. Excellent Science

Total Budget of the Program: 24,4 billion €s.

- European Research Council
- New and Improving Technologies
- Marie Curie Activities
- Research Infrastructure

4. HORIZON'2020 – TUBITAK Coordination

TUBITAK, while providing the necessary orientation and coordination for the participation to EU projects, undertakes the factor of increasing performance on this subject as a mission. According to this mission, it encourages organizations to participate in consortiums and project preparations with various supports. In this context, it created support and reward programs. These are:

- Travel support: Expenses similar to participation and travelling fees, participation to the meeting fee for an individual invited for a meeting by the coordinator to science days that are organized within the scope of Horizon'2020 are covered by TUBITAK financially.
- Project Pre-Evaluation Support: For draft projects before being presented to the European Commission, evaluation or examination of the project by an expert or a consultancy company and similar work is financed by TUBITAK.
- Support for being a Coordinator: Travelling Support for the purpose of Establishing a Consortium, Organizational Support for the purpose of Establishing a Consortium, Education Support for Project Writing-Presentation, Project Writing Services Support or Project Pre-Evaluation Services Support is included (TUBITAK, 2014).
- Supraliminal Award: Award given by TUBITAK for projects which are, after being evaluated by expert independent referees, any project called in private and determined to have more points than supraliminal points.
- Merit pay is a reward given to certain projects after specific evaluations if the project owner applies direct or indirectly.

Aside from these, TÜBİTAK, when the calls start, is assigning personnel for calling headlines and establishing consortiums about those headlines and is also doing some studies on carrying offers for Consortium to related authorities in Turkey.

5. Effects of Public Transport on HORIZON'2020

Public transport authorities can be included in many topics indirectly and carry out supportive activities. However, within the scope of the program, under the heading of Societal Challenges, subject of public transport is pointed out directly. Smart, clean, integrated transport program reserved its 6,339 million €s budget for public transport projects. Public transport authorities such as İETT, EGO, ESHOT etc. can create consortiums for the innovative and visionary projects they wish to bring to life, can search for partners for the projects that they have drawn the lines for or by participating in the consortiums that they established, they can do studies make their project come to life. Another reasonable topic for the public transport authorities to be included is the headline of secure, clean and efficient energy. In this topic, 5,931 million €s budget is reserved. As is known, one of the most important subjects that the public transport is interested in the latest years is the subject of carbon emission. Under this heading, many subjects similar to reducing carbon emission, giving public transportation support to establish carbon free zone, usage of electric cars etc. are foreseen to be included in the projects.

6. Smart, Clean and Integrated Transportation in Terms of Public Transport and Evaluation of Effective Energy Programs and World Transportation Trends

Amongst the subjects that the public transport authorities undertake as their missions, meeting the needs of passengers come first. Especially in metropolis cities, public transport authorities aim to meet the increasing demand showing positive acceleration with the increase in population and limited sources.

In the last century, as the roads were improving and highway transportation becoming more common, important certain problems were also transferred to our current century. Situations such as increasing traffic density, congestion, delays, travelling time caused an increase with the accidents.

In order to decrease these negative effects of transportation systems or at least to control it, the idea was revealed as, systems established to control it should at least be more efficient, safe, secure, active and economically designed and maintained. Concept of Smart Transportation Systems (STS) came to life as a result of an effort like this (Yardımcı and Akyıldız, 2004).

Half of the total annual oil consumption throughout the world and one of three of the total energy consumption is done on public transport sector 8 (OECD, 2012). This unreasonable result, for a sustainable life cycle, proves the importance of smart systems and efficiency in the transportation sector.

For smart transportation systems to be regulated with today's technology, most important factor is advanced transportation management systems. When these systems are applied, instantaneous solutions to instantaneous problems can be brought forward. Advanced transportation management systems, aside from being informed instantaneously about traffic congestion and unexpected events, also gives possibility to regulate features such as speed limits, traffic lights, electronic traffic signposts, lane separation from a central location or automatically. Furthermore, these systems can ensure control and toll collection processes from remote or automatically at the part of the road which is accessible with a fee. In some situations, in order to maintain the traffic flow, pricings to toll roads can also be done dependent on time aside from the vehicle type (Black and others, 2006).

Another one of the headings discussed within the scope of Horizon'2020 is, coordinating an entire city by a smart and integrated system with Smart Cities. With these systems, all activities within the master plan for the city can be coordinated. Subject of transportation holds an important ground for smart cities. For example, estimative organizations such as special activity, event, walking, concert etc. are entered into the system. For these situations that might affect the traffic flow, new routings are established as planned before. For non-assessable natural causes, accidents etc. which cannot be estimated beforehand, case analysis are being developed. In such situations,

alternative routes, lines and courses having a flexible movement capability can only be made possible with smart transportation systems.

On the subject of constructing smart city systems, one of the most important subjects that all authorities are on is doing all this within the master plan. Of course managing an entire city with a single smart city application is not possible. Sustainability and flexibility of the installed systems should not be removable with the systems that came after it, it should be able to feed the new systems that are currently available and this is only possible if it is done within a master plan.

For this approach, in smart city applications, shows the importance of pilot application work. For smart buildings, all smart applications similar to delivering public services from e-systems, planning transportation systems beforehand and delivering them to passengers from mobile systems, including all cases that are estimated or not estimated beforehand into the system, integrated bicycle roads, giving bicycle services from mobile applications, using NFC systems, especially pilot application should be chosen for small regions to gain the necessary experience.

Moreover, within the scope of Horizon'2020, new type of approach that the authorities are oriented at is, instead of doing master plans for wide masses, its sustainability analysed with a master plan on terms of point of view should be in project offers with the application being tested for smaller regions.

At the outset of mechanisms that trigger efficient and clean energy, Kyoto Protocol which became valid at 16 February 2015 is the first. After finishing the term also named as first term at the year of 2012, it was elongated for 8 years between the dates 1st of January 2013 – 31st of December 2020. Kyoto protocol is a protocol, for the purpose of regulating purpose and principles to be applied and improved; it came to discussion for signature at the 3rd meeting of "Parties Conference" which is held annually by Climate Change Frame Contract prepared by the European Union. It could be shown as the most comprehensive agreement in terms of fighting climate change. Its main purpose; is to stop threatening effect born of humans with greenhouse gas accumulation to a threatening level on the climate systems. Essential responsibility of the countries signing this protocol is, within the measurements of scope of the values determined with the protocol, is to reduce greenhouse gas emissions.

The most important value given to countries by Kyoto protocol: "awareness". This sustainable life concept led by Kyoto continues on countries increasing its effects. In this protocol where European Union countries also had various commitments to, it was seen that secure, clean and effective energy program will contribute under the headings within the scope of Horizon'2020. Horizon'2020, aside from supporting environmental projects with different topics related to fighting against climate change, reserved a 5,931million €s of funds just for secure, clean and efficient energy program.

When energy efficiency is mentioned within the context of transportation, first factors that come to mind are clean fuel and common use of vehicles that do not consume fuel oil, raising vehicle standards, informing consumers and orienting them to vehicles with lower emission is some of the factors within.

In the transportation sector, %99 of the consumed energy is provided by fuel sources and %25 of the greenhouse gas comes from transportation. In our country, if it is considered that about %90- 93 of the goods and passenger transport is done on highways, subject of greenhouse gas oscillation gains a serious meaningful importance.

On the subjects of using efficient and clean use of energy in transportation, various studies are being run. With the Metrobus project done by IETT, 625,000 ton carbon dioxide oscillation has been prevented. Furthermore, using vehicles with electricity and CPG and energy deficiency can also be obtained.

On projects where carbon emissions were inspected within the safe, clean and efficient energy program of Horizon'2020, within the plan of aimed values to be determined to be decreased, on projects where distribution of roles between authorities are being conducted, public transport sectors can replace them.

Lowering carbon emission values to an individual can only be possible with mass transportation authorities are accepted into the system. On travels which are done with individual cards, amount of carbon in emission can be determined. In order to support reduction of individual carbon emission reduction, it is pre-projected to use various awarding mechanics and create a new trend like. Subjects similar to “Choosing the passenger of the month, granted free rights to ride” are subjects that are discussed around the globe and can be shown as encouragement to people to join this act of individual reduction. By GSM operators being included into the system or following individual carbon emissions from mobile applications should form other important parts of the ending.

IETT as one of the public transport authorities has some projects related to smart transportations systems and energy. Main terms amongst these are:

Driving Simulator Systems: Driving simulations exclusively is recreation of all characteristics of a real vehicle and the environmental factors which it is in relations with the vehicle within the virtual media. Driving Simulators are facilities designed to give people the real drivers to drive a vehicle on an experimental stand. Essential reasons for using the simulator are to reducing the amount of time spent on R&D and education and expenses.

On Board Internet Service: Serving vehicles are aimed to provide free wireless service to all passengers while it's moving. Project is being funded by Istanbul Development Agency with a supportive gift.

On Board Charging Service: As an obligatory need for the daily life, this aimed to provide the possible need for energy for mobile phones during the trip. With this application, all devices similar to mobile phones and tablets can be charged in the bus continuing the trip and save on their time. Project is being funded by Istanbul Development Agency with a supportive gift.

Announcing System for Disabled: For visually-impaired individuals, by giving life to certain required regulations in public transport, with the purpose of increasing these individuals participation to social life and to give a more comfortable and accessible public transportation service, a system that announces the bus approaching the station, line number, its destination orally has been put on the vehicles. Project is being funded by Istanbul Development Agency with a supportive gift.

Touch Screen at Stations: It was aimed for the passengers to use this informative touch screens interactively and get a higher quality service.

CNG Motor Change: Buses that were chosen after feasibility studies, by doing their CNG changes, they both save on fuel and prevent harmful gases from being released into the environment with exhaust emission.

Echo Driving Systems: After giving echo driving educations, with driver personnel who are more aware things, less fuel is consumed and less carbon is emitted into the atmosphere providing higher driving quality.

Aside from these, authorities other funded projects that come to the fore are about the subject of transportation which may be funded are, estimation algorithms within the scope of Horizon'2020, push to talk systems and studies done related to them.

7. Expected Results

IT technologies attract the attention as an important opportunity in the aspect of increasing energy efficiency in the transportation sector. Due to IT technologies, for carbon dioxide emissions caused due to transportation at the year of 2020, %11(2,2 Gt) decrease is estimated globally (GeSI, 2008).

For this decreasing that is estimated for the year of 2020, various movements have started. Horizon'2020 is supported with clean and active energy programs along with smart, clean and integrated transportation that

contributes to the increasing of pre-envisioned efficiency. If we collect the priority fields of the program in a table like a summary, it can be shown on the figure below.



Figure 1. Priority areas (European Innovation Partnership on Smart Cities and Communities – Strategic Implementation Plan, 2013)

Starting with smart, clean and integrated transportation heading that point to public transport, for public transport authorities to join consortiums and for their secure, clean and effective energy programs Turkey is seen as a very important country for Europe. Especially for services provided at Istanbul, having more users compared to other European countries in ratio, cosmopolite structure, features such as being able to hold all cases, can be interpreted as an advantage for Turkish authorities to be part of this projects.

The most important factor for all the projects that will be done is collaboration with universities. Systems envisioned as university sources and public or private sector applications are all gathered together, are seen as an ideal roof instalment for a project. In this context, for the universities, as seen at the example with Istanbul Commerce University, the need to raise awareness in terms of making EU and EU projects more common amongst their units is revealed.

For Turkey, benefiting at a maximum level from HORIZON'2020 and being involved in global technology development projects, for TUBITAK in particular, are seen as important developments for all authorities.

References

- Kayasü S., Pınarcıoğlu M., Yaşar S., Dere S., (2003), Yerel/Bölgesel Ekonomik Kalkınma ve Rekabet Gücünün Artırılması: Bölgesel Kalkınma Ajansları, İstanbul, İstanbul Ticaret Odası, Yayın No: 2003-8
- Hughes J.T. (1998) 'the role of development agencies in regional policy: An academic and Practitioner approach'. Urban Studies 35.4, 615-624
- Goddard J.B., Chatterton P., (1999), "Regional Development Agencies and The Knowledge Economy: Harnessing The Potential of Universities", Environment and Planning Center: Government and Policy, Volume 17, 685-689. İstanbul Ticaret Üniversitesi/İstanbul Commerce University <http://ww4.ticaret.edu.tr/abmerkezi/>
- Türkiye Bilimsel ve Teknolojik Araştırma Kurumu, Uluslararası İşbirliği Daire Başkanlığı, Avrupa Birliği Çerçeve Programları Ulusal Koordinasyon Ofisi: 'AB 7. Çerçeve Programı-Ara Değerlendirme Raporu), 2012, Ankara
- Bağnaçık, A., 2014, 'Horizon 2020 Araştırma ve Yenilik Projelerinin Analizi', İstanbul

ec.europa.eu/programmes/horizon2020/h2020-sections

www.h2020.org.tr/tr/content/koordinator-olma-destekleri

Yardıı, S., Akyıldız, G., Akıllı Ulařtırma Sistemleri ve Türkiye'deki Uygulamalar, Yıldız Teknik Üniversitesi, 2004

OECD, World Energy Outlook, 2012

BLACK, W. R., M. van GEENHUIZEN, "ICT Innovation and Sustainability of the Transport Sector", EJTIR, Vol. 6, No.1, 2006, pp. 39-60.

Global Sustainability Initiative (GeSI), Smart 2020: Enabling the low carbon economy in the information age, 2008.

European Innovation Partnership on Smart Cities and Communities - Strategic Implementation Plan, 14.10.2013, page 7.