This project is funded by the European Union

Annual Action Programme for Turkey for the Year 2015 under the Instrument for Pre-accession Assistance (IPA II)

Technical Assistance for Improvement of Performance-Based Tariff Regulation of EMRA for Turkish Energy Markets through Introducing an Enhanced Monitoring System

Project Identification No: EuropeAid /139125/IH/SER/TR

Contract No: TR2015/EN/07/A3-01/001

Two workshops for task 3

Electricity and Natural gas

03-04 March 2020

REBUBLIC OF TURKEY ENERGY MARKET REGULATORY AUTHORITY

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Project Title	:	Technical Assistance for Improvement of Performance-Based Tariff Regulation of EMRA for Turkish Energy Markets through Introducing an Enhanced Monitoring System
Contract Number	:	TR2015/EN/07/A3-01/001
Project Value	:	1,800,300.00 Euros
Starting Date	:	24/04/2019
End Date / Duration	:	23/10/2020 / 18 months

Contracting Authority: **Republic of Turkey Ministry of Treasury and Finance**
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Reporting Period	:	3th of March to 4th of March 2020
Date of Report	:	6th March
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Abbreviations

AMS	Advanced Metering Systems
ARC	Assigned / Incumbent Retail Company
CAPEX	Capital Expenditures
CAPM	Capital Asset Pricing Model
CENS	Cost of Energy not Supplied
CI	Customer Interruptions
CML	Customer Minutes Lost
DEA	Data Envelopment Analysis
DGM	Dividend Growth Model
DNO	Distribution Network Operators
DSO	Distribution System Operator
EML	Electricity Market Law
EMRA	Energy Market Regulatory Authority
EU	European Union
ICPs	Independent Connection Providers
IDNOs	Independent Distribution Network Operators
IQI	Information Quality Incentive
IIS	Interruptions Incentive System
MAR	Market to Asset Ratios
MENR	Ministry of Energy and Natural Resources
NPAM	Network Performance Assessment Model
NRA	National Regulatory Authority
OPEX	Operational Expenditures
R&D	Research and Development
RAB	Regulatory Asset Base
RAV	Regulatory Asset Value
RIIO	Revenue = Incentive + Innovation + Output
RoC	Rate of Change
RoR	Rate of Return
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SoLR	Supplier of Last Resort
TEIAS	Turkish Electricity Transmission Co.
TIM	TOTEX Incentive Mechanism
TSO	Transmission System Operator
TTC	Time to Connect
TTQ	Time to Quote
VoLL	Value of Loss Load
WACC	Weighted Average Cost of Capital
YEKDEM	Renewable Energy Support Mechanism (FIT)

1 Introduction

In accordance with the Terms of Reference two workshops for both electricity and natural gas sectors are organised to identify capabilities, needs and expectations of regulated entities about innovation and R&D. The two workshops are part of Activity 3.1 and were organized on 03-04 March 2020, in Limak Ambassadore Hotel in Ankara.

The first day of the workshop was attended by 44 people, namely 11 staff from EMRA, 4 representatives from BOTAŞ and 10 from TEİAŞ, 8 representatives from MENR, and 11 representatives from the TAT where the issues regarding electricity were discussed.

The second day of the workshop was attended by 33 people, namely 7 representatives from EMRA, 10 representatives from BOTAŞ, 4 representatives from MENR, and 12 representatives from TAT where the issues regarding natural gas were discussed.

2 The purpose of the meeting

Project Purpose is to improve the capacity of EMRA by the development of a new performance-based tariff calculation mechanism, including a social tariff.

The project aims at three main **results**:

1. Methodology for performance-based tariff calculation is developed.
2. Energy market monitoring system of EMRA is improved.
3. EMRA's capacity to regulate market through the use of performance-based tariffs is enhanced.

3 Structure of the workshop

Both first day and second day meetings were started with the opening speech done by Mr Wietze Lise – the Team Leader of the Tariff project. He informed the participants on agenda and introduction to workshop content. He informed the audience that for Task 1 the workshops and the two study visits were completed, and report will be finalized soon. He mentioned that task 2 is in the current focus in the project. The workshop that we are reporting on is under Task3. Task 4 is on smart grids where a road map will be developed. He mentioned that there are still 3 more tasks to be done (Tasks 5-7), which will commence soon.

3.1 Workshop on Electricity

The 1st day workshop continued after the opening speech. Mr. Tosun summarised the part that has been done in task 3 and 4 for electricity part. He mentioned that the present workshop is not part of task 4. Moreover, task 3 will be talked about in both days. R&D and innovations will be discussed for both electricity and natural gas transmission and distribution as these sectors continue to grow.

For electricity, distribution surveys and condition assessment will be done as part of implementing task 3. Some questions like how to operate a tariff system in the benchmark process, R&D project management process, etc. will be answered. He also mentioned about central roles of DSOs, regulatory approaches related to innovation. Later on Ms. Durukan took the stage and talked about overcoming barriers towards innovation in electricity transmission and also gave recommendations about the subject. Mutual opinions were shared about the barrier recommendations prepared by the TAT team. She also gave an overview about the ENTSO-E approach. Her suggestions for TEİAŞ were discussed during the presentation; also TEİAŞ gave their opinions on issues that needed to be discussed.

In the afternoon, the electricity session of the workshop was continued with Ms. Emer and Mr. Tosun's interactive session to get directions to focus the work of Task 3. In order to give real time answers to the questions, the participants were asked to access the prepared survey on "mentimeter.com" using their phones or computers. Some questions were asked such as; Innovation and Smart Grid, Regulatory approaches for Incendivity, TEİAŞ's main targets for innovation, Priority domains for Innovations, approaches for Innovation efforts, Public sharing of R&D project outcomes, main target and etc. All the questions expected to be answered by the participants were about their opinion of priorities and importance level. The answers given by the participants and averages were seen on the screen anonymously and each question were evaluated with the given answers.

3.2 Workshop on Natural Gas

The 2nd day of the workshop also started with team leaders opening speech and Mr. Özen gave a short introductory presentation regarding the ongoing innovative actions for gas distribution and transmission networks in the EU. He pointed out that those actions are part of the EU targets in terms of decarbonization and zero emission goal by 2050. Emphasizing the capacity of gas networks to transmit and store energy, he stated that the use of the existing gas infrastructure for transportation of renewable gases and hydrogen became main concern in the EU. New gas package in the EU is expected to cover the issues as the new gas quality norms, support of investments for transporting renewable gases and coupling of the gas and electricity networks.

Mr. Vlachos, an international NKE expert on gas, gave information on gas distribution. He mentioned couple main topics to present. He talked about the future roles of DSOs, High level description of different regulatory, measuring R&D performance efficiency, and lastly about recommendation about innovation activities in distribution utilities.

The next presentation was presented by Mr. Orlandini, an internal gas expert, based in Spain, who delivered his presentation via Skype. Due to the health issues in EU countries (coronavirus) he wasn't able to participate to the workshop, even though his travel was initially arranged. Mr. Orlandini tried to fly from different countries other than Italy, however Italian community are not allowed to come to Turkey until end of March. Because he was a very valuable expert for the workshop and transmission part for natural gas, TAT asked the beneficiary for the confirmation of a skype call. After the approval came from the beneficiary and CFCU, Mr. Orlandini made his presentation on the second day of the workshop. The quality of skype call was very well arranged from the both sides.

Mr. Orlandini and Jose Manuel Menendez highlighted some important subjects such as description of different regulatory approaches on transmission innovation, Great Britain regulatory incentives application. He also detailed his presentation and helped visualize it with graphs.

The second part of the meeting was held in the form of interactive survey, same as first day of the meeting, which included the participants with the help of Ms. Emer and Mr Vlachos. There were some questions were as follows; expectations from innovation and smart grid; regulatory approaches for incentivizing innovation; overall assessment of the need for innovation support; priority Domains for İnnovation activities etc.

4 Discussion & Recommendations

At the end of the presentations, according to the agenda of the meetings, participants were encouraged to express their views on the Natural Gas and Electricity sectors. The summary of the discussion topics is presented below.

4.1 Remarks on Natural Gas

In accordance with the outputs of questionnaire app; i.e. mentimeter.com, following items came to the forefront.

For Distribution market:

- Expectations from innovation and smart grid focused on "enhancing the efficiency of the existing gas distribution network" and "gas trading markets".
- Today's problems with innovation activities are mostly related with "organizational problems in Distribution System Operators that discourage innovation efforts", "lack of a systematic approach to track the results, lessons learnt and real life experience for innovation", "lack of cross-sectoral know-how sharing platform", and "leveraging problems of know-how developed under R&D projects to business processes and operational practices".
- Priority domains for innovation activities are prioritized as energy efficiency services, data handling and meter ownership, grid operation and safety, and flexibility services respectively.
- Financial instruments for incentivizing innovation mostly underlined incentives through R&D budget; i.e. innovation performance of the DSOs to be assessed for decision about their R&D / Innovation budget allocation.
- Recovery of innovation expenditures is highly thought to be dependent on revenue cap.
- Main targets for innovation activities highlighted adaptation of international state-of-art solutions according to local requirements (reaching EU level in innovation and smart grid)

For Transmission market:

- Expectations from innovation and smart grid focused on optimal utilization and management of network assets, promoting R&D, domestic technology and market development, improved service quality, enhanced situational awareness & controllability, and use of LNG/CNG for transportation; e.g. maritime transport.
- Today's problems with innovation activities are mostly related with organizational problems in Transmission System Operators that discourage innovation efforts, lack of a systematic approach to track the results, lessons learnt and real life experience for innovation, and leveraging problems of know-how developed under R&D projects to business processes and operational practices.
- Priority domains for innovation activities are prioritized as cyber security, grid efficiency, advanced metering infrastructure (smart meters), grid asset management, and transmission network monitoring, control and management respectively.
- Recovery of innovation expenditures is highly thought to be dependent on revenue cap.
- Main target of BOTAŞ for innovation activities highlighted adaptation of international state-of-art solutions according to BOTAŞ requirements (reaching EU / ENTSO-G level).

4.2 Remarks on Electricity

In accordance with the outputs of questionnaire app, i.e. mentimeter.com, following items came to the forefront.

For Distribution market:

- Expectations from innovation and smart grid focused on improving service & power quality, grid reliability and resiliency, power system flexibility, optimal utilization and management of network assets, and enabling demand side response and customer engagement.

- Today's problems with innovation activities are mostly related with lack of a systematic approach to track the results, lessons learnt and real life experience for innovation, different maturity and technology development levels amongst 21 DSOs, leveraging problems of know-how developed under R&D projects to business processes and operational practices, and lack of cross-sectoral know-how sharing platform.

- Priority domains for innovation activities are prioritized as distribution network monitoring, control and management, demand response, advanced metering infrastructure (smart meters), cyber security, grid asset management, big data analytics, and battery and energy storage systems respectively.

- Financial instruments for incentivizing innovation mostly underlined incentives through competition, i.e. allocation of certain portion of the R&D budget based on competition of innovation projects.

- Recovery of innovation expenditures is thought to be dependent on both operational savings, incentives, revenue cap and new business enabled by innovation efforts almost equally.

- Main targets for innovation activities highlighted developing DSO innovation skills, exploring potential functionalities and benefits of the existing system, and adaptation of international state-of-art solutions according to local requirements (reaching EU level in innovation and smart grid).

For Transmission market:

- Expectations from innovation and smart grid focused on improving service & power quality, enhancing monitoring & controlling of network, and optimal utilization and management of network assets.

- Priority domains for innovation activities are prioritized as "control center, SCADA/EMS and substation / field automation systems", "protection systems and relay infrastructure", "cyber & physical security systems", "TSO-DSO coordination", and "asset & data management, analytics, enterprise IT, application integration" respectively.

- Regulatory approach for incentivizing innovation mostly underlined indirect incentives and obligations for the TSO.

- Main targets of TEİAŞ for innovation activities highlighted adaptation of international state-of-art solutions according to BOTAŞ requirements (reaching EU / ENTSO-G level), owning product development, and internal competence development of TEİAŞ personnel.

- TEİAŞ's main challenge for increasing innovation activities are listed as hesitations for risky projects due to Public Procurement Law (KIK), inefficient organizational structure, and lack of capacity building

5 Conclusion

The workshop was arranged as electricity sector on the first day and natural gas sector on the second day. The workshop provided a forum for questions and answers after each presentation. The participants expressed their satisfaction with the workshop content and organizational arrangements. At the end of the workshop, it was stated that all presentations will be shared with the participants.

6 Agenda

AGENDA 3 March 2020 – Electricity focused workshop		
Time	**Agenda item**	**Presenter/Moderator**
09:30 – 10:00	Opening and Task summary	Wietze Lise, Team Leader
10:00 – 11:00	Regulatory approaches about incentivizing innovation and R&D activities for distribution utilities	Gökhan Tosun, senior NKE
11:00 – 11:30	Coffee break	
11:30 – 12:30	Innovation in transmission systems and support mechanisms	Yıldız Durukan, senior NKE
12:30 – 14:00	Lunch break	
14:00 – 16:00	Polls and discussions on capabilities, needs and expectancies of regulated entities about innovation (Interactive session)	Gökhan Tosun, senior NKE Esin Emer, junior NKE
AGENDA 4 March 2020 – Natural Gas focused workshop		
Time	**Agenda item**	**Presenter/Moderator**
09:30 – 10:00	Opening and Task summary	Wietze Lise, team leader Erdinç Özen, Senior NKE
10:00 – 11:00	Regulatory approaches about incentivizing innovation and R&D activities for distribution utilities	Dr. Ioannis Vlachos, International senior NKE

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11:00 – 11:30	Coffee break	
11:30 – 12:30	Innovation in gas transmission sectors, support mechanisms and regulatory approaches	Arnaldo Orlandini, International senior NKE Jose Manuel Menendez, Senior Consultant MSC
12:30 – 14:00	Lunch break	
14:00 – 16:00	Polls and discussions on capabilities, needs and expectancies of regulated entities about innovation (Interactive session)	Gökhan Tosun, senior NKE Dr. Ioannis Vlachos, senior NKE Esin Emer, junior NKE