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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

Training for Task 3.4
Electricity and Natural gas
02-04 September 2020





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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

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Reporting Period : 02nd of September to 04th of September 2020

Date of Report : 14 September

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Abbreviations

BOTAS	Turkish Petroleum and Gas Transmission Pipeline Company
CAPEX	Capital Expenditures
CFCU	Central Finance and Contracts Unit
DSO	Distribution System Operator
EDVARS	Electricity Distribution Data Storage and Reporting System
EMRA	Energy Market Regulatory Authority (for Electricity, Petroleum and Natural Gas)
EPIAS	Market Financial Settlement Centre
EU	European Union
EUD	European Union Delegation
EXIST	Energy Exchange Istanbul
FIT	Feed-in tariff
HD	Human Dynamics
MENR	Ministry of Energy and Natural Resources
OPEX	Operational Expenses
OSOS	Automatic Meter Reading System
PM	Project Management
PSC	Project Steering Committee
R&D	Research and Development
R&I	Research and Innovation
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SoLR	Supplier of Last Resort
TAT	Technical Assistance Team
TEIAS	Turkish Electricity Transmission Co.
ToR	Terms of Reference
WACC	Weighted Average Cost of Capital

1 Introduction

According to the Terms of References, the training under Task 3 of the Tariff project was planned as 2-day training (1 day for electricity and 1 day for natural gas). Because of the pandemic situation worldwide and in Turkey, EMRA and TAT decided to conduct the training online. After the addendum was submitted and approved by the CFCU, an online meeting was held with all experts and participants. The two trainings sessions were part of Task 3 - Best Practices Regarding Innovation and Recommendations for Regulated Electricity and Gas Entities that will enhance monitoring and were organized online on 02/09/2020 and 04/09/2020.

The first day of the training was attended by 46 people, namely 31 staff from EMRA and 15 representatives from the TAT where issues related to the electricity sector were discussed.

The second day of the workshop was attended by 42 people, namely 28 representatives from EMRA and 13 representatives from TAT where issues related to the natural gas sector were discussed.





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2 The purpose of the meeting

Summary of the project and training:

Overall Project Objective is to improve the functioning of electricity and gas markets in line with EU requirements.

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.

This training is the **fourth activity under Task 3** – Incorporating incentive mechanism into tariff structure to enhance innovation capabilities of regulated entities. The purpose of the training is to strengthen the institutional capacity with respect to making incentive mechanisms part of the tariffs, with the purpose to enhance the capabilities of regulated entities for innovation.

The objectives of the trainings could be summarized as:

- Present the outputs of Task 3
- Inform the participant about innovation funding and support mechanisms in EU
- Provide insights about different regulatory approaches towards innovation R&D activities of electricity and gas utilities, as well international best practices
- Describe the recommendations to incentivize innovation including legislative changes

These two **trainings**, each for one day and 20 Ankara-based EMRA staff per training day, will provide instruction on the outputs of Task 3. More specifically, the EMRA staff will be trained on best practices regarding tariffs that incentivize innovation, recommendations to incentivize innovation, including legal changes and data requirements to incorporate this incentive into the current tariff structure. (Out of city participation is not foreseen.)

The Contractor will conduct the training via the ZOOM platform to facilitate interaction. There will be audio-based Turkish-English simultaneous interpretation available during the online training. Both days will be focusing on two separate sectors, namely electricity and natural gas.

Participants from EMRA are herewith invited to attend this training and to benefit from the ongoing work in the Tariff project for EMRA.





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3 Structure of the training

Mr. Tosun commenced with the opening speech. He gave a brief introduction on the tasks that will be discussed during the training. Presentations were made in accordance with the agenda by experts on both days and Q&A was made after all presentations. However, some of the questions were answered during the presentation in order to provide a better understanding of the topic.

3.1 First day of Training

First day of the meeting started with the presentation of Mr. Tosun on Innovation Funding and Support Mechanisms in the EU for Electricity Companies; International benchmarks, best practices and regulatory approaches about incentivizing innovation; Roles, responsibilities, strategies and actions of regulated entities and public institutions in incentivizing country-specific targets; Gap Analysis and Recommendations. These topics were all related to the Electricity Distribution sector.

After a lunch break for the participants, afternoon session started with Ms. Durukan who continued with the following topics: ENTSO-E Innovation and R&D Activities; International benchmark, best practices and regulatory approaches about incentivizing innovation; Gap Analysis and Recommendations. These topics were all related to the Electricity Distribution sector. After the presentation was completed, an interactive section was launched in the form of Q&A for detailed answers to the questions posed by the participants.

3.2 Second day of Training

The second day of the training commenced by Mr. Vlachos. He presented on Innovation and R&D Studies in European Gas Distribution ; International benchmark, best practices and regulatory approaches about incentivizing innovation; Roles, responsibilities, strategies and actions of regulated entities and public institutions in incentivizing country-specific targets; Gap Analysis and Recommendations. These topics were all related to the Natural Gas Distribution sector.

Afternoon session Mr. Orlandini and Mr. Menendez presented on Innovation and R&D Studies in European Gas Transmission, ENTSO-G Innovation and R&D Activities; International benchmark, best practices and regulatory approaches about incentivizing innovation; Gap Analysis and Recommendations. These topics were all related to the Electricity Distribution sector. As on the first day of the workshop, the presenters gave detailed answers to the questions asked by the participants.

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 discussions is presented below.

4.1 Remarks on Electricity Distribution

Following the analysis and assessment, general regulatory framework in Turkey for fostering innovation activities of distribution companies is well-developed, robust and well beyond the average EU practices, although the relevant secondary legislation has become effective only the last 5-6 years.

“Principles and Procedures for Supporting Research, Development and Innovation Activities of Electricity and Natural Gas Distribution Companies” are being improved by EMRA as additional regulatory needs arise and the maturity of the DSOs evolve on innovation activities. For example, with a very recent update on the secondary legislation;





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incentives have been defined for patenting and a dedicated budget has been allocated for encouraging collaborations with start-ups and entrepreneurs to further catalyse the innovation environment.

The recommendations are provided to

- enable further evolvement of regulatory support,
- improve project evaluation and monitoring processes, and
- facilitate large-scale innovation and pilot demonstration projects.

To summarize key elements of the recommendations, the following could be listed:

- EMRA should continue to support DSO innovation to ensure the culture of innovation continues to develop within the distribution sector. Consideration should be given as to how support for DSO innovation can best accommodate the future requirements of the entire energy system.
- DSOs should be required to develop and publish an ‘innovation roadmap’. This should be developed in line with the national strategies and in conjunction with TEIAS’ plans.
- Both the capital and the operating expenses are to be allowed by dedicated R&D budget, whereas any capitalization of the R&D costs in the RAB must be reflected in corresponding revenues.
- There should be greater focus on the sharing of project knowledge and learning – particularly across and between the DSOs –in order to maximise the benefits and value of R&D budgets allocated.
- More focus should be placed on the learning which results from unsuccessful projects, or parts of projects.
- Monitoring/reporting requirements associated with R&D projects should be reviewed to facilitate the assessment of quantitative benefits and a systematic tracking of project outcomes should be implemented.
- DSOs should be encouraged to coordinate with relevant governmental institutes, and other R&D stakeholders, to explore opportunities to share and exchange project learnings and experience with other energy sectors.

4.2 Remarks on Electricity Transmission

The Main Statutory Document of TEIAS gives a specific responsibility and power to the TSO for conducting R&D studies and determining new performance criteria to increase service quality and customer satisfaction.

In April 2018, “TEIAS Advisory Board and R&D Directive” has been published, which has been developed to organize the R&D activities regarding designing new processes, products and applications that will provide scientific and technological development related to the fields of activity of TEIAS. The scope of this Directive includes the determination of the application, implementation, audit and reporting principles of the Research and Development activities at TEIAS General Directorate as well as the issues related to the Advisory Board.

Observations regarding TEIAS’ R&D and innovation processes can be listed as follows:





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- The details of the R&I projects such as the results of closed projects and progress of on-going projects are not disclosed publicly.
- Typical R&D partners for TEIAS are, caused by laws for public procurement, mainly R&D institutes and universities. This means that there are at least 2 innovation barriers to tackle, before TSOs can actually start to use innovation. This is a contributing factor to why innovations typically take such a long time in TSOs.
- R&I Projects are susceptible to being challenged by inspection bodies having tangible-results oriented approach which contrasts with nature of R&I activities. TEIAS is more prone to realize low-risky R&I projects having tangible outputs.

A key role for the Government and EMRA is to create an environment for new ideas to flourish by removing barriers to innovation. Electricity transmission system needs technologies and infrastructure that should be both cost-efficient and clean, but it also needs innovation in processes, transactions, and consumer offerings. This shall be a fundamental part of the Government's Industrial Strategy and EMRA's approach to regulation.

There is 'de-regulation' of EMRA on TSO's R&D budget and projects in Turkey. There are advantages and disadvantages of the existing regulatory framework of EMRA for TEIAS' innovation activities aiming to obtain R&D outputs. However, we can state that advantages are less than disadvantages, because the existing TEIAS' activities on the innovative projects are not at the expected level of quantity and quality.

Beyond addressing these regulatory approaches, there is a question of how innovation in the transmission system infrastructure and operation technologies of the future can be catalysed. TEIAS is not exempted from Public Procurement Law. Innovative Projects are susceptible to being challenged by inspection bodies, having a tangible-results oriented approach which contrasts with the nature of R&I activities. TEİAŞ has hesitations for especially risky projects due to Public Procurement Law. Therefore, TEİAŞ is more prone to realize low-risk innovative projects having tangible outputs. On the other hand, innovative projects, capital intensive projects resulting in uncertain future OPEX gains (efficiency improvements / cost reductions) are not incentivised by the regulatory framework yet.

As part of this, there is a need for roles and responsibilities of EMRA to set up regularity framework to support TEIAS, as the regulated monopolies, by removing barriers for innovative projects in the transmission system to evolve so that network and system operation as a whole is managed efficiently. Thus, TEIAS departments to catalyse innovation activities, not pursuing a timid approach anymore.

Based on overarching principles, international experiences, and the situation in Turkey, we think that the innovation incentive mechanism for electricity transmission shall be defined around the following key features:

- Definition of innovation priority areas.
- Specific OPEX allowance for innovation and R&D expenditures of BOTAS revenue determination.
- R&D expenditures are included, upon approval of EMRA, in the revenue cap recovered via network tariffs.
- Periodical reporting and monitoring of TEIAS R&D expenditures by EMRA.





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4.3 Remarks on Natural Gas Distribution

As the secondary legislation for gas distribution and electricity distribution companies are equivalent, it's been assessed that overall regulatory framework in Turkey for fostering innovation activities of gas distribution companies is well-developed, robust and well beyond the average EU practices.

Expected changes in the gas sector raise new challenges for regulators in designing effective regulatory models. These changes and new challenges can be divided in three categories: technical, economic and organisational. These new challenges generally trigger the need for changes in regulatory tools and/or regulatory aims.

“Principles and Procedures for Supporting Research, Development and Innovation Activities of Electricity and Natural Gas Distribution Companies” are being improved by EMRA as additional regulatory needs arise and the maturity of the DSOs evolve on innovation activities (For example, with a very recent update on the secondary legislation; incentives have been defined for patenting and a dedicated budget has been allocated for encouraging collaborations with start-ups and entrepreneurs to further catalyse the innovation environment.)

In this part, the recommendations are provided to

- enable further evolvement of regulatory support,
- improve project evaluation and monitoring processes, and
- facilitate large-scale innovation and pilot demonstration projects.

To summarize key elements of the recommendations, the following could be listed:

- EMRA should continue to support DSO innovation to ensure the culture of innovation continues to develop within the distribution sector. Consideration should be given as to how support for DSO innovation can best accommodate the future requirements of the entire energy system.
- DSOs should be required to develop and publish an ‘innovation roadmap’. This should be developed in line with the national strategies and in conjunction with BOTAS’ plans.
- Both the capital and the operating expenses are to be allowed by dedicated R&D budget, whereas any capitalization of the R&D costs in the RAB must be reflected in corresponding revenues.
- There should be greater focus on the sharing of project knowledge and learning – particularly across and between the DSOs –in order to maximise the benefits and value of R&D budgets allocated.
- More focus should be placed on the learning which results from unsuccessful projects, or parts of projects.
- Monitoring/reporting requirements associated with R&D projects should be reviewed to facilitate the assessment of quantitative benefits and a systematic tracking of project outcomes should be implemented.
- DSOs should be encouraged to coordinate with relevant governmental institutes, and other R&D stakeholders, to explore opportunities to share and exchange project learnings and experience with other energy sectors.

4.4 Remarks on Natural Gas Transmission

After analysing the current situation in Turkey with respect gas transmission innovation we think it is recommendable that EMRA develops a new innovative incentive mechanism.





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The innovation incentive mechanism for Turkey gas transmission sector should be based on three general principles:

1. Effectiveness. The final objective is to upgrade gas TSO innovation activities aiming to obtain R&D outputs that could eventually lead to benefits for both network users and TSOs (e.g. efficiency gains) and positive externalities for the population (e.g. carbon emissions saving). Therefore, the innovation incentive mechanism must be effective, that is, it must achieve that BOTAS invests on R&D studies and on the deployment of innovative solutions.
2. Flexibility. The mechanism shall be designed in a way that leaves enough flexibility for both BOTAS and EMRA to implement the incentive in the most suitable way. Establishing rigid and predefined regulatory and compliance requirements at this early stage of the innovation strategy may hamper the implementation of the strategy. Compliance requirements should not be an excessive administrative burden for BOTAS that could eventually discourage R&D expenditures.
3. Efficiency. Innovation incentive costs will ultimately be borne by customers via network tariffs. There is a direct trade-off in the short-term between higher allowed R&D expenditures and higher network tariffs. The incentive mechanism must not allow BOTAS to include in the revenue cap excessive unjustified expenses. The role of EMRA is to review and monitor innovation expenditures of BOTAS to guarantee that allowed R&D revenues are invested in an efficient way.

Based on these principles, international experiences, and the situation in Turkey we think that the innovation incentive mechanism for gas transmission shall be defined around the following key features:

- Definition of innovation priority areas.
- Specific OPEX allowance for innovation and R&D expenditures of BOTAS revenue determination.
- R&D expenditures are included, upon approval of EMRA, in the revenue cap recovered via network tariffs.
- Periodical reporting and monitoring of BOTAS R&D expenditures by EMRA.

5 Conclusion

A more detailed explanation was made to the participants in the training, where both the Electricity and the Natural Gas sectors were covered on different days. Participants showed great interest in the training and expressed their satisfaction with the information and content of the national and international experts. The training achieved its goals, whereas the training was attended by more participants than expected. Participants were informed that all presentations and minutes of the training will be shared after the training.





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6 Agenda of the training

Detailed Agenda for Electricity Training

1. Opening and Task summary

- Welcome
- Topics that are covered in this task
- Task implementation approach

2. Innovation Funding and Support Mechanisms in EU for Electricity Companies

- Horizon 2020 Framework Program
- Horizon Europe Framework Program
- ERA-NET
- Connecting Europe Facility (CEF)
- Other Support Mechanisms

3. International benchmark, best practices and regulatory approaches about incentivizing innovation (Electricity Distribution)

- Different regulatory approaches on incentivizing innovation efforts
- Selected country practices (UK, Italy, France, Norway, Portugal, Netherlands, Finland) for regulation of distribution innovation activities

4. Roles, responsibilities, strategies and actions of regulated entities and public institutions in incentivizing country-specific targets (Electricity Distribution)

- Innovation and R&D
- Electric Vehicles Charging Infrastructure
- Power Storage
- Distributed Generation
- Energy Efficiency

5. Gap Analysis and Recommendations (Electricity Distribution)

- Overarching Principles
- Recommendations About Tariff Methodologies and Incentives
- Scope of Innovation Business/Master Plan
- Evaluation of R&D Project Applications and Monitoring
- Allocation of R&D Budget According to Project Types
- Priority Innovation Areas for the Turkish Electricity Distribution Sector
- Other Recommendations





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6. ENTSO-E Innovation and R&D Activities

- ENTSO-E Vision on Transmission Innovation
- General description of ENTSO-E approach on cross-continental innovation activities
- ENTSO-E Recommendations for Innovation Framework

7. International benchmark, best practices and regulatory approaches about incentivizing innovation (Electricity Transmission)

- Different regulatory approaches on incentivizing innovation efforts
- Selected country practices (UK, Italy, France, Norway, Finland) for regulation of transmission innovation activities

8. Roles, responsibilities, strategies and actions of regulated entities and public institutions in incentivizing country-specific targets (Electricity Transmission)

- Grid Operation and Safety
- Power Electronics
- Data Management and Digitalization
- Sector Coupling
- Relation between TSOs and DSOs

9. Gap Analysis and Recommendations (Electricity Transmission)

- Overarching Principles
- Summary of Recommendations

10. Wrap-up and Q&A

Detailed Agenda for Gas Training

1. Opening and Task summary

- Welcome
- Topics that are covered in this task
- Task implementation approach

2. Innovation and R&D Studies in European Gas Distribution

- Support Mechanisms
- Selected Projects

3. International benchmark, best practices and regulatory approaches about incentivizing innovation (Gas Distribution)

- Different regulatory approaches on incentivizing innovation efforts
- Selected country practices (UK, Italy, France, Ireland, Finland) for regulation of distribution innovation activities
- Comparison of country regulatory practices



4. Roles, responsibilities, strategies and actions of regulated entities and public institutions in incentivizing country-specific targets (Gas Distribution)

- Gas Smart Meter
- Flexibility Services
- Infrastructure for Natural Gas Vehicles
- Energy Efficiency Services
- Smart Gas Grids

5. Gap Analysis and Recommendations (Gas Distribution)

- Overarching Principles
- Recommendations About Tariff Methodologies and Incentives
- Scope of Innovation Business/Master Plan
- Evaluation of R&D Project Applications and Monitoring
- Allocation of R&D Budget According to Project Types
- Priority Innovation Areas for the Turkish Gas Distribution Sector
- Other Recommendations

6. Innovation and R&D Studies in European Gas Transmission, ENTSO-G Innovation and R&D Activities

- ENTSO-G Vision on Transmission Innovation
- ENTSO-G Innovative Project Platform
- Funding Mechanisms

7. International benchmark, best practices and regulatory approaches about incentivizing innovation (Gas Transmission)

- Different regulatory approaches on incentivizing innovation efforts
- Selected country practices (UK, Italy, France, Norway, Finland, Spain) for regulation of transmission innovation activities
- Comparison of country regulatory practices

8. Gap Analysis and Recommendations (Gas Transmission)

- Overarching Principles
- Summary of Recommendations

9. Wrap-up and Q&A



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AGENDA 02 September 2020 – Electricity focused training		
Time	Agenda item	Presenter/Moderator
10:00 – 10:10	Opening and Task summary	Wietze Lise, Team Leader Gökhan Tosun, senior NKE
10:10 – 10:30	Innovation Funding and Support Mechanisms in EU for Electricity Companies	Gökhan Tosun, senior NKE
10:30 – 11:00	International benchmark, best practices and regulatory approaches about incentivizing innovation (Electricity Distribution)	Gökhan Tosun, senior NKE
11:00 – 11:30	Roles, responsibilities, strategies and actions of regulated entities and public institutions in incentivizing country-specific targets (Electricity Distribution)	Gökhan Tosun, senior NKE
11:30 – 12:00	Gap Analysis and Recommendations (Electricity Distribution)	Gökhan Tosun, senior NKE
12:00 – 13:30	Break-2	
13:30 – 14:00	ENTSO-E Innovation and R&D Activities	Yıldız Durukan, senior NKE
14:00 – 14:30	International benchmark, best practices and regulatory approaches about incentivizing innovation (Electricity Transmission)	Yıldız Durukan, senior NKE
14:30 – 15:00	Gap Analysis and Recommendations (Electricity Transmission)	Yıldız Durukan, senior NKE
15:00 – 15:30	Wrap-up and Q&A	Gökhan Tosun, senior NKE Yıldız Durukan, senior NKE





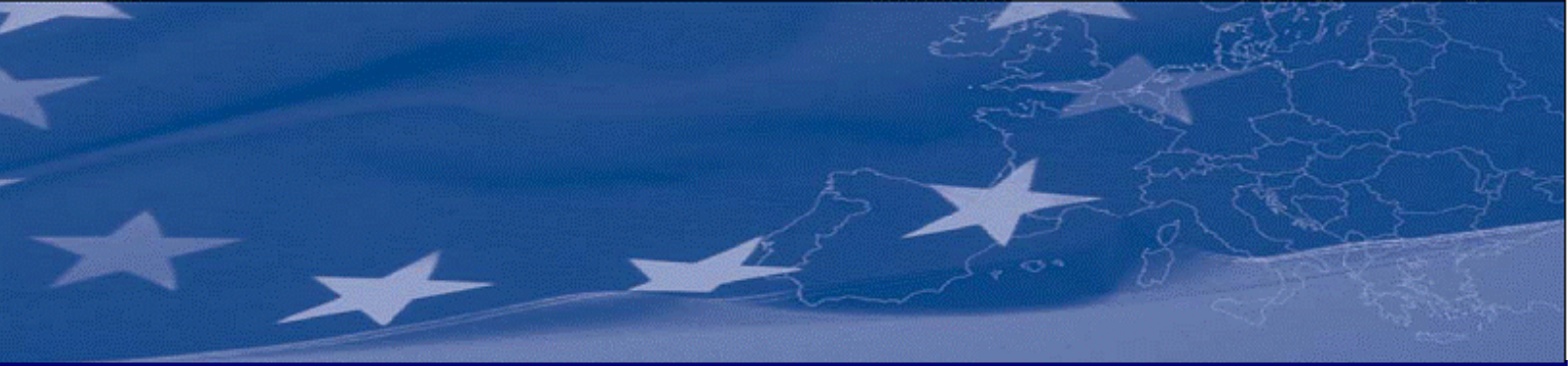
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AGENDA 04 September 2020 – Gas focused training

Time	Agenda item	Presenter/Moderator
10:00 – 10:10	Opening and Task summary	Wietze Lise, Team Leader Gökhan Tosun, senior NKE
10:10 – 10:30	Innovation and R&D Studies in European Gas Distribution	Dr. Ioannis Vlachos, senior NKE
10:30 – 11:00	International benchmark, best practices and regulatory approaches about incentivizing innovation (Gas Distribution)	Dr. Ioannis Vlachos, senior NKE
11:00 – 11:30	Roles, responsibilities, strategies and actions of regulated entities and public institutions in incentivizing country-specific targets (Gas Distribution)	Dr. Ioannis Vlachos, senior NKE
11:30 – 12:00	Gap Analysis and Recommendations (Gas Distribution)	Dr. Ioannis Vlachos, senior NKE
12:00 – 13:30	Break	
13:30 – 14:00	Innovation and R&D Studies in European Gas Transmission, ENTSO-G Innovation and R&D Activities	Arnaldo Orlandini, senior NKE Jose Menendez, senior NKE
14:00 – 14:30	International benchmark, best practices and regulatory approaches about incentivizing innovation (Gas Transmission)	Arnaldo Orlandini, senior NKE Jose Menendez, senior NKE
14:30 – 15:00	Gap Analysis and Recommendations (Gas Transmission)	Arnaldo Orlandini, senior NKE Jose Menendez, senior NKE
15:00 – 15:30	Wrap-up and Q&A	Dr. Ioannis Vlachos, senior NKE Arnaldo Orlandini, senior NKE Jose Menendez, senior NKE Gökhan Tosun, senior NKE





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