Minutes of the Workshop

1. **Background**

The Danube Water Program (DWP) in association with the Romanian Water Association (ARA) organized on February 12-13, 2018 in Bucharest a regional workshop on Performance-Based Contracts (PBCs) for Non-Revenue Water (NRW) reduction. This event brought together about 60 participants from Danube basin countries, as well as other countries with relevant experiences and interests, so as to discuss the potential for PBC approaches to support water losses reduction in the region, and how such projects could be best designed and implemented. The audience included representatives of central governments and public agencies, water utilities, NGOs (national utilities associations), the private sector and donors.

2. **Workshop Agenda**

The Workshop spanned over 2 days, February 12 – 13, 2018 and comprised of 12 sessions as detailed in Appendix A. Opening speeches were made by the Mr. Mihail Marinescu, Vice President of ARA, by Mr. Gheorghi Constantin, Ministry of Water and Forests, Mr. Bogdan Alexa, President of ANRSC and Ms. Patricia Lopez, DWP Leader / World Bank. The key messages of the workshop are presented below and a summary of each session is presented in Appendix B.

A. **Why is NRW reduction so important?**

Reducing NRW delivers multiple benefits:

1. Improves customer service levels – higher pressures and/or better continuity and/or expanded coverage
2. Enhances asset lives and utility management – NRW reduction leads to improved level of service (24/7)
3. Improves utility financial performance by reducing costs and increasing revenues (also benefitting government finances!)
4. Makes cities more competitive when accompanied by service improvement
5. Improves climate resilience by reducing demand on scarce water resources
6. Reduces emission of GHGs – less energy/m3 delivered

This is not a “win win” (W2) – it is a “win win win win win win” (W6)

B. **What are the Key Features of a PBC?**

1. Defines desired outputs and outcomes within a given time frame
2. Links the achievement of set targets to relevant remuneration
3. Focuses on results and thus provides the contractor with some flexibility on deciding how it will achieve its targets, it is not prescriptive
4. Applies to a wide variety of services and contracts

However in designing the contract and incentives framework a number of important factors need to be taken into consideration:

1. Ring Fencing – the interface between the contractor and the utility’s operations needs to be carefully considered
2. Remuneration/Risk – striking a proper balance between fixed and variable payment, fair sharing of risk is essential
3. A good baseline is critical – this needs to be agreed by both parties in order to have a reference to compare the improvement against
4. Target setting – the targets must be ‘achievable’ (i.e. realistic) and sufficiently ambitious in order to have optimum outcome
5. Performance measurement – choosing the right NRW indicator is crucial for measuring true gains in efficiency: e.g. m3 reduction per day instead of % losses
6. Sustainability – ensuring that the gains achieved can be made sustainable after completion of the contract

There is no blueprint for this type of contract. Well-designed PBCs are heavily customized contractual PPP instruments and must take into consideration local conditions and requirements.

C. How to Design and Implement a PBC for NRW Reduction

The WB – PPIAF through a Global Program on Developing PBC Practices for Managing NRW have developed a set of tools that can be used both within the World Bank Group and externally to quickly develop effective PBCs. A set of tools were produced in order to facilitate the design and implementation of PBCs including an operational manual, training curricula and slides, a financial model, a standard procurement document, etc. The Operational Manual describes and visualizes the process for planning and implementing NRW PBCs presented in a graphical form in the figure below.
D. Closing Remarks

The closing remarks are provided in bullet format below:

1. High NRW levels in the Balkans and Eastern Europe – 40 to 60% of SIV
2. Little effort has been made so far to reduce these levels
3. Network is approximately 70% of utility’s assets
4. NRW is a core measure of how a utility is managed
5. Reducing water losses is at the heart of utility management and always has been!
6. NRW PBCs are increasingly seen as a tool to help utilities
7. PBC has incentives…. you perform ….. you get paid
8. Solutions have to be tailored to address the specific problem and the varied risk/reward profiles of each client
9. PBCs are very relevant in the Balkans and Eastern Europe
10. Need to change mind sets:–
    a. Leadership (water loss is our core business)
    b. Incentive structure (e.g. extra payment to the staff)
    c. PBC can help in reducing losses and increase utility efficiency
11. IFIs (WB, IDB, EIB, EBRD…) are supporting projects in the Danube region and the global effort for reducing NRW
12. Success requires the cooperation of all
### FEBRUARY 12, 2018 MORNING SESSION
#### SETTING THE STAGE

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:30 – 9:00</td>
<td>Registration &amp; Coffee</td>
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<tr>
<td>9:00 – 9:30</td>
<td>Opening speeches:</td>
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<tr>
<td></td>
<td>Mr. Mihail Marinescu, Vice President, Romanian Water Association</td>
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<td>Ministry of Water and Forests, Government of Romania</td>
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<td>Mr. Bogdan Petru Alexa, President, ANRSC</td>
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<td>Ms. Tatiana Proskuryakova, Country Manager, World Bank</td>
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<td>Ms. Patricia Lopez, Danube Water Program Leader, World Bank</td>
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<tr>
<td>9:30 – 10:15</td>
<td>Session 1: What is PBC and how can it help deal with the challenges of reducing NRW?</td>
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<td>Mr. Bambos Charalambous, World Bank consultant and IWA expert</td>
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<tr>
<td>10:15 – 10:45</td>
<td>Session 2: Situation of NRW in Romanian WSS utilities</td>
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<td>Mr. Mihail Marinescu, Vice President, Romanian Water Association</td>
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<tr>
<td>10:45 – 11:15</td>
<td>Coffee Break</td>
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<tr>
<td>11:15 - 11:45</td>
<td>Session 3: Situation of NRW in other Danube countries</td>
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<td>Ms. Patricia Lopez, Danube Water Program Leader, World Bank</td>
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<tr>
<td>11:45 – 12:30</td>
<td>Session 4 – IFIs and other development partners panel: whether and how NRW PBC can be relevant for Danube countries</td>
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<td>Discussants: Representatives of the World Bank, EBRD, EIB and GIZ</td>
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<td>12:30 – 13:45</td>
<td>Lunch</td>
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### FEBRUARY 12, 2018 AFTERNOON SESSION
<table>
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<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenter(s)</th>
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<tbody>
<tr>
<td>13:45 – 14:30</td>
<td><strong>Session 5:</strong> Comparison of Turnkey and Co-Management of NRW PBCs (Kingston, Jamaica and New Providence, Bahamas)</td>
<td>Mr. Roland Liemberger, Director, Miya</td>
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<tr>
<td>14:30 - 15:15</td>
<td><strong>Session 6:</strong> The PBC NRW contract in Ho Chi Minh, Vietnam and other examples from Asia (Thailand, Malaysia)</td>
<td>Mr. Bill Kingdom, Lead Water and Sanitation Specialist, World Bank</td>
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<td>15:15 – 15:30</td>
<td><strong>Coffee break</strong></td>
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<td>15:30 – 16:15</td>
<td><strong>Session 7:</strong> Examples of new PBCs for NRW in preparation: the cases of Constanta (Romania) and Beirut (Lebanon)</td>
<td>Mr. Aurel Presura, Deputy General Manager, RAJA Constanta</td>
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<td>Mr. Bambos Charalambous, World Bank consultant and IWA expert</td>
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<tr>
<td>16:15 – 17:00</td>
<td><strong>Session 8:</strong> Practical session to discuss with panel and audience some key issues on the design and development of PBC for NRW</td>
<td>Mr. Philippe Marin, Sr. Water and Sanitation Specialist, World Bank</td>
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<tr>
<td>17:30 – 20:00</td>
<td><strong>Cocktail reception and dinner at the hotel</strong></td>
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**FEBRUARY 13, 2018 MORNING SESSION**

**LOOKING FORWARD**

<table>
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<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenter(s)</th>
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<tr>
<td>9:00 – 9:30</td>
<td><strong>Session 9:</strong> the WB-PIAF global initiative on NRW PBC</td>
<td>Mr. Bambos Charalambous, World Bank consultant and IWA expert</td>
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<td>9:30 - 10:30</td>
<td><strong>Session 10 - Private sector panel:</strong> what can private companies contribute and what do they expect in well-designed PBC NRW contracts</td>
<td>Chair: Mr. Philippe Marin, Sr. Water and Sanitation Specialist, World Bank</td>
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<td>Discussants: Representatives from Miya, Malta WSC, BDO Romania, Suez, Saur, others (tbc)</td>
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<td>10:30 – 11:00</td>
<td><strong>Coffee Break</strong></td>
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<td>11:00 – 12:00</td>
<td><strong>Session 11 - Public sector/utilities panel:</strong> what should the public sector expect from PBC NRW? And how can IFIs and other development partners help?</td>
<td>Chair: Mr. Sorin Caian, Senior Partner, BDO Business Advisory</td>
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<td>Discussants: representatives from water and sanitation utilities and sector authorities</td>
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<tr>
<td>12:00 – 12:30</td>
<td><strong>Session 12 – Wrap up and closing remarks:</strong> next steps</td>
<td>Mr. Bambos Charalambous, World Bank consultant and IWA expert</td>
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<tr>
<td>12:30 – 13:45</td>
<td><strong>Closing lunch</strong></td>
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APPENDIX B Session summary

February 12, 2018: Setting the Stage

Session 1: What is PBC and how can it deal with the challenges of reducing NRW?

In this opening session the basic problems faced by water utilities relating to the NRW and the centrality of Water Loss Management in the proper operations of a water utility were outlined. The importance of a NRW Management Long Term Strategic Action Plan was stressed based on specific targets and deliverables in order to achieve sustainable and self-financed operations. An innovative way forward to achieve such an outcome is the reduction of NRW through the application of a Performance Based Contract (PBC). It was highlighted that in a PBC for NRW reduction the desired outputs within a given time frame are defined and remuneration is linked to performance. PBCs can be used for reduction of Physical or Commercial Losses or both. It is important however to pay attention to details when designing such contract to take into consideration factors such as: ring fencing, remuneration and risk (both by the employer and the contractor), the indicators to be used to measure performance, the contractual targets to be set (realistic and achievable), and the sustainability of the outcome in order to maintain the gains of efficiency.

Session 2: Situation of NRW in Romanian WSS utilities

A short introduction of the Romanian water supply sector was made providing elements and key figures for the 43 regional operators (ROCs) as well as the progress since Romania entered the European Union (EU) in 2007. The population served by the ROCs in 2008 was 53,1% of the total population compared to 65,2% in 2016. Definitely EU funding contributed to a large degree in the rehabilitation of old networks and extensions to the existing in order to supply more people. However it is evident that there was limited effort to reduce NRW and to improve operational efficiency of the supply and distribution networks. The reported NRW varies between 25% and 65% of SIV with an average of 43 %. The physical losses vary between 10 m3/km/d and 40 m3/km/day with an average figure of 25 m3/km/d and between 200 and 700 liters/service connection/day with an average figure of 460 liters/connection/day. These figures indicate a poor level of performance by the majority of the ROCs which must be addressed through strategic action planning for NRW reduction. Each ROC should have its own strategy on how to reduce its level of losses. Applying PBC is an obvious way forward to achieve NRW reduction in a reasonably short period of time and in a cost effective manner.

Session 3: Situation of NRW in other Danube Countries

NRW levels in Central and Southeastern Europe vary in huge ranges with most water utilities having NRW between 40 – 60% of System Input Volume. Despite overall improvement and convergence, the efficiency of water utilities in the Danube basin region is below best EU standards. Overall, the region’s utilities are on a positive trend toward better efficiency, but one that is also marked by significant differences among and within countries. NRW has been and continues to be a significant challenge in the region. Among EU member states of the region, Bulgaria has the highest NRW followed by Romania. While Romania has a better NRW than several non-EU countries of the region (Albania, FYR Macedonia, Montenegro and Bosnia), it appears to be however out-performed by Serbia, Ukraine and Moldova. Croatia that has only recently joined the EU, has a similar NRW level as Romania, but all other EU-13 member states in the region reported lower levels of NRW. The World Bank through the
Danube Water Program is supporting water utilities in the region in building capacity in key aspects of NRW management, such as, understanding NRW concept and water losses, water balance development and interpretation of results, network zoning (DMAs), active leak detection, flow and pressure management and leak detection equipment.

Session 4: IFIs and other Development Partners Panel

The panel comprised of Mr. Emmanuel Morel from EIB, Ms. Danaielca Ionescu from EBRD, Mr. Georgi Hristov from GIZ and Mr. William Kingdom from the World Bank. The session focused on whether and how PBC for NRW reduction can be relevant to the Danube region and what are the hurdles that currently hamper the application of such contracts. A brief summary, in bullet format, of the views expressed by the panelists is given below:

- Very high NRW in the Danube region certainly deserves attention and its reduction is very relevant.
- Availability of reliable and audited data being the foundation stone for planning NRW reduction projects is not readily available.
- A number of projects and initiatives, such as the Benchmarking in Romania, the sector reports for the Danube countries, the preparation for a PBC for NRW reduction in a pilot zone in Constanta, all supported by the IFIs are contributing in improving awareness and capacity building as well as properly preparing the way forward for the reduction of losses.
- A conceptual barrier to moving forward with PBCs for NRW reduction is the fact that water utilities wrongly believe that such contracts relate to privatization; this perception needs to be changed.
- There is a need for strong regulation in the countries of the region which will support the application of PBCs.

Session 5: Comparison of Turnkey and Co-Management of NRW PBCs

Two case studies were used to compare two different types of contracts for NRW reduction; a 10 year turnkey project with a large component of Performance Based compensation for NRW reduction in the New Providence, Bahamas and a 5 year co-management contract in Kingston, Jamaica.

The Turnkey PBC comprised an initial 5 year period of NRW reduction and another 5 years for maintaining the level of NRW and the gains in network efficiency. The Co-Management comprised of a 2 years period of Strategy Preparation and Execution led by the contractor, a further 2 year consolidation period gradually handing over to the employer the responsibility for the project and a 1 year Sustainability period during which the Employer’s staff are fully managing the project with Contractor only taking action where necessary.

The conclusions drawn from these two case are as follows:

- Turn-key NRW PBC is much more efficient and easier to implement.
- Sustainability is problematic for both contract types.
- Co-management PBC can be cheaper if water utility has a lot of excess staff which can be seconded to the project.

Session 6: The PBC NRW Contract in Ho Chi Minh, Vietnam and other examples from Asia
The Ho Chi Minh City (HCMC) project was a high risk / high reward type of contract, output-based with a strong performance element. The contract duration was 4 years + 1 year maintenance period. The area that the contract covered served approximately 1 million people served from about 141,000 number of connections and 662km of network. The results went beyond the set targets. The volume of water saved was approximately100,000 m3/d almost halved the pre-project amount of leakage. The water saved could have served 500,000 additional people in HCMC. This was achieved by dividing the network to 114 DMAs and by targeted replacement of mains, less than 1 % and about 6% of the service connections. The number of leaks repaired were 12,000 in 662 km of pipe, i.e. 1 every 50 m length of mains. It is evident from this case study that leakage reduction could be effectively carried out with very little replacement of pipes contrary to the popular belief that this could only be done by massive pipe replacement program.

PBCs could also be applied to reduce commercial losses. The case of SABESP, the water utility of Sao Paolo focused on (i) Reduction in bad debts and (ii) Increase in large customer meter accuracy. For the former the focus was on domestic and commercial customers in selected areas. For the two year contract additional $43 million were collected – a very quick return. For the latter the target was to replace 27,000 meters with properly designed and installed system to address under registration of consumption. The contractor pre-financed with reimbursement based on increased volumes of water sold. The revenues increased by $72 million with contractor remuneration at $18m, net gain to the utility of $54 million, a case of win-win for both contractor and employer.

Session 7: Examples of other PBCs for NRW in Preparation: the cases of Constanta (Romania) and Beirut (Lebanon)

Constanta (Romania):

EBRD is funding a PBC for NRW reduction project for city of Constanta. Phase 1 of the project which included a feasibility study of the options that could be applied was undertaken and completed in 2017 on the basis of which the utility, Raja Constanta, have carried out additional work in order to prepare the part of the network that will be ring fenced for NRW reduction. The actions taken so far by the utility were:

i. The network was divided into 5 supply zones
ii. 57 bulk water meters were installed
iii. 50 DMAs were set up
iv. Flow/pressuring measurement at 250 point in the network were installed

In Phase 2, coming up soon, the ToR for a PBC for NRW reduction will be prepared and the utility will conclude a financing contract for the project with EBRD.

Beirut (Lebanon):

The WB within the framework of the Water Supply Project for Greater Beirut is providing technical assistance to Beirut and Mount Lebanon Water Establishment (BMLWE) for the preparation of contract documents for leakage reduction in a Pilot Zone in Beirut using a PBC. Reducing leakage further in areas where 24x7 has already been achieved in Beirut is the next milestone in BMLWE’s strategy for switching to 24x7 continuous supply. Adding more water to the overall water balance is a prime goal of BMLWE and the reduction of physical losses is a cost effective way of achieving this. It
is therefore planned that DMAs which are being supplied continuously and have customer meters installed in 15 DMAs, having a total of 300km length of mains, shall form part of a PBC contract for leakage reduction.

The main activities of the Contract shall be:

i. Installation of a Telemetry and Monitoring System
ii. DMA Validation, Flow-and-Pressure Adjustment and Hydraulic Modelling.
iii. Water Loss Reduction Activities and Management.
iv. Training and Transfer of Technology.
v. Maintenance of the water loss reduction level for a period of 1 year.

The tender is planned to be published in the mid 2018.

**Session 9: The WB-PPIAF global initiative on NRW PBC**

The WBG – PPIAF Global Program on Developing PBC Practices for Managing NRW has the objective to develop good practices on PBCs in the Marketplace to manage NRW. The program was driven in part by the WBG need for a tailored procurement document and standardized approach for PBCs. The Program goal is to catalyze increasingly better practices in the marketplace on PBCs for NRW Management. The aim is to develop good PBC practices in the marketplace to manage NRW, to assist in capacity building and engagement of private service companies to effectively implement PBCs, to develop new contracting arrangements and to successfully pilot PBCs for NRW reduction. To achieve these aims the WBG developed an Operational Manual, Training Curricula and Slides, a Financial Model which will be complemented by a Standard Procurement Document is currently being developed. All of the above resources will soon be available from a WBG website. For more information the following website could be visited. [https://ppp.worldbank.org/public-private-partnership/sector/water-sanitation](https://ppp.worldbank.org/public-private-partnership/sector/water-sanitation)

**Session 10: Private Sector Panel: what private companies can contribute and what do they expect in well-designed PBC NRW contracts**

The panel comprised of Luke Pace, WSC of Malta, Augustin Boer, BDO Romania, Roland Lemberger, Miya and Yoshua Yeres, ex director of business development for Hagihon Water Utility. The panelists shared their experiences and views on PBC for NRW reduction and highlighted the importance of efficient water utility management through the application of proved practices, methodologies, technologies and innovation. Malta’s WSC have over the years gained experience in managing their distribution networks under scarcity conditions and have applied appropriate technologies in order to measure and continuously monitor flows and pressures in the network. Recently the installation of an AMR system which covered all customers thus providing them real-time NRW monitoring. WSC are now in a position to share the knowledge and expertise gained over the years with other utilities through knowledge transfer and capacity building. Mr Boer outlined the work that BDO carried out on the feasibility study for a PBC for NRW reduction in Constanta funded by EBRD. He referred to the legal framework that currently exists in Romania and how the PBC needs to be framed as a service contract and to follow EBRD procurement procedure in order to overcome the obstacles of the Romanian legislation for this type of contract. He also referred to the limitations of data to establish
a reliable baseline and the guidelines provided to the utility during the feasibility study to improve the quality of data. Mr Liemberger referred to setting up a company 10 years ago in Romania to address NRW reduction using the PBC concept. The company closed after 1 year without carrying out any projects. Mr. Liemberger believes that even now Romania is not ready yet for PBC for NRW reduction projects. Mr Yeres stressed that innovation and technology play an important part in the solutions presented to the utilities to reduce NRW and that technology can help to change the way utilities do business.

**Session 11: Public Sector/Utilities Panel: What should the public sector expect from PBC NRW? And how can IFIs and other development partners’ help?**

The panel comprised of Lindita Sotiri, Ministry of Infrastructure and Energy (Albania), Mihail Dorus, Apavital Iasi (Romania), Calin Neamtu, Compania de Apa Somes SA (Romania), Liliana Zafirova, Ministry of Regional Development and Public Works (Bulgaria), Sandy Zulic, Una Consulting Ltd (Bosnia Herzegovina) and Yoshua Yeres, Innovation/Technology Company (Israel). The panelist highlighted the current situation in their respective countries with regard to NRW and its reduction using PBC.

In Albania the NRW is quite high (67%) and intermittent water supply is widely practiced (about 12 hours /day). It is estimated that some euro 8 million is the cost of the water lost. The government of Albania is making investment in the water sector (about euro 50 million). The government is pushing utilities to perform and has in this direction introduced a performance program (public to public) between the Ministry of Infrastructure and Energy/Municipalities and the water utilities with the aim to reduce subsidies to the utilities. The program has been introduced in December 2017 and the results are extremely encouraging, in the first 3 months there was an increase in the revenues of the utilities of euro 7 million. In Romania, the Regional Operating Companies (ROCs) have been investing in extending and/or rehabilitating their assets, water supply and sanitation, using funds available from EU programs. However not sufficient attention has been given to improving the efficiency of the water supply systems resulting in very high NRW. The ROCs are state owned companies having to comply with stringent laws, regulations and procedures thus making the introduction of PBCs difficult. A successful first PBC for NRW reduction would provide the impetus needed to move PBCs forward in Romania. The water utilities in Bulgaria are managing the assets which are state owned. Bulgaria is facing similar problems to Romania and relies on EU funding to improve the networks. There are numerous challenges in reducing NRW in Bulgaria and the experience of the private sector would be very important in accelerating the process. The NRW situation in Bosnia Herzegovina is very similar to that of all other Eastern European countries. Efforts are being made to introduce the private sector and to promote PBCs for NRW reduction stressing that efficiency improvement is directly linked to financial gain for the utility. Mr Yeres stressed that to improve NRW in the Dnube region there has to be a shift in mind set and to start running the utilities as a business which do not have to rely on government subsidies but are self-funded. The utility operations need to be looked at in financial terms and this would certainly involve appropriate regulation, accountability and financial robustness through appropriate tariffs.