



Pre-Feasibility Study Industrial Waste Water Management and Drainage System, Da Nang, Vietnam

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Executive Summary

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A. Introduction and objectives

1. The Study, financed by CDIA/ADB, was carried out in the period February to June 2012 and its objectives are to assess at prefeasibility level for the city of Danang:

- 1.1. Improvement of waste water management at Hoa Khanh and Lien Chieu industrial zones and identify and scope priority projects;
- 1.2. Separate storm water from municipal waste water in Eastern Coastal area (districts of Son Tra and Ngu Hanh Sown) and identify and scope priority projects;
- 1.3. Recommend on private sector participation in proposed priority projects and viable PPP contract options to bring them to market.

B. Institutional context

2. Our Study's added value stems from our focus on the two IZs, Hoa Khanh and Lien Chieu. And for municipal waste water management, our unique proposition builds on our focus Son Tra and Ngu Hanh Sown districts and in particular preparing a preliminary design and cost estimate for (1) tertiary and secondary dedicated wastewater infrastructure; and (2) household connections to the dedicated lines.

3. Moreover, our Study's targets aims at assessing private sector participation in our proposed priority projects further harnessing its unique proposition. Main stakeholders and decision making process have been described. Main actors in industrial waste water are DIEPZA and DAIZO. WWDC, the municipal waste water and drainage company holds responsibility for the municipal waste water system including the sewer system and WWTPs.

C. Industrial waste water management

4. A flat water treatment tariff of US\$0.33/m³ is paid by all companies located in the IZs. Actual connection rate is unknown but its sub-optimization is due to a deficient conveyance system. The extent of pre-treatment by the industries on the IZ is unknown. Both URENCO and Quoc Viet (responsible for WWTPs) collect waste water fees from the companies in their respective IZ.

5. Current waste water flows are for Hoa Khanh IZ 9,360 m³/day and for Lien Chieu IZ 3,040 m³/day. In identifying priority projects we propose to combine effluent from the adjacent extended Hoa Khanh IZ. In the design of required capacity we make projections for the period up to 2040.

6. We have identified and scoped four priority projects: (1) revamping and expanding WWTP Hoa Khanh; (2) revamping and extending sewerage Hoa Khanh (3) Survey on Lien Chieu WWTP given that available information is scant and does not allow any inferences; (4) Survey on water consumptions and waste water flows. CAPEX for these four priority projects amount to US\$5.6 million.

D. Municipal waste water management

7. An assessment of the municipal drainage system in Son Tra and Ngu Hanh Son districts points to a wide array of issues and constraints in addition to managerial problems and various managerial. We adhere to Danang's waste water strategy in identifying and scoping priority projects and prioritize water service zones into five groups. Building on this we estimate CAPEX in various scenarios; (1) the base case scenario resulting in USD 368 million; (2) an alternative scenario with a reduced CAPEX of USD 275 million; and (3) a

refined version of the alternative scenario with a CAPEX of USD244 million, Finally, we have prepared a time-planning for implementing proposed priority projects.

E. Socio-economic assessment

8. About 132,000 inhabitants are currently directly affected by the industrial waste water management deficiencies and 90,000 affected by the municipal component. These numbers are likely to increase steeply taking into consideration the indirect effects. Our identified priority project will have a positive impact on: (1) improved health and living conditions in our Study area; (2) tourism business; (3) farmers and fishermen; (4) capacity building in participatory approaches; (5) showcase of a PPP in waste water management.

F. Environmental assessment

9. We have provided high level environmental base line information of the Study's area in particular on surface and ground water. Impacts of the priority project and mitigation measures have been prepared for three phases of the project life-cycle that is (1) pre-construction; (2) construction; (3) O&M. Further studies targeting EIAs for the proposed priority projects have been identified.

G. Financial and economic assessment

10. Hoa Khanh WWTP requires upward adjustment of 76 percent from current USD 0.33/m³ to USD 0.58/m³ in order to cover all cash requirements. Same magnitude of tariff increase will be required in Lien Chieu IZ. FIRR for the overall project in Hoa Khanh at 19.2 percent far exceeds the WACC at 1.6 percent. For Lien Chieu, FIRR is likewise high at 12.6 percent. The proposed investments in the Eastern Coast is financially viable as indicated by FIRR at 1.7 percent for project overall, exceeding the WACC at 1.4 percent.

11. The economic analysis for the IZs indicates economic viability of undertaking the proposed improvements. The municipal drainage project as a whole is economically viable with EIRR at 22.4 percent exceeding EOCC.

H. Lessons learned and regulatory framework

12. Lessons learned from international case studies in PPPs in waste water management point to the need to integrate as much as possible Design Build Na Operation. CAPEX are usually financed by Government and a PPP's objectives should be seen in the context of uplifting operating efficiencies and quality of the services.

13. Current PPP Regulations are conducive towards our proposed PPP models and no legal impediments exist Of special interest is the fact that the current PPP regulations are a pilot only and DPI can sidestep it. It is allowed to retain all project related activities and does not need to reach out to the Inter-Ministerial Steering Committee based in Hanoi responsible for implementing these regulations.

I. PPPs in industrial waste water management

14. Hoa Khanh WWTP has been contracted out to URENCO (O&M contract) and Lien Chieu WWTP to Quoc Viet (BOT contract). The objectives of the current PPP assessment are to (1) revamp and extend the waste treatment systems in both IZs in addition to bringing in a reputable operator to uplift operating efficiencies and quality of the services. For both IZs we recommend a Design Build Operate and Maintain model akin to a BOT but with CAPEX financed by the GoV.

15. We recommend to maintain the current WWTP operators and not terminate their contracts. The selected operator is expected to work closely with the existing companies (URENCO and Quoc Viet) in a Joint Venture. Finally we present managerial implications to GoV of the proposed PPPs both in the procurement – and operation and contract management phase.

J. PPPs in municipal waste water management

16. We believe that a PPP in this sector should be seen as an intermediate step towards transforming WWDC into a Joint Stock company combining both public and private shareholders. We recommend to combine both the WWTP and drainage system into one PPP contract. A Design Build Operate Maintain PPP contract model is preferred akin to a BOT but with CAPEX financed by the GoV. Finally we flesh out managerial implications to GoV both in the procurement – and operation and contract management phase.

K. Final conclusions and recommendations

17. We present final conclusions on both municipal and industrial priority projects in addition to its socio-economic and environmental implications. A comprehensive financial assessment point to robust economic viability of the projects further cementing its decision making. Finally, we conclude on recommended PPP contract modalities to move forward the projects on a PPP basis with a clear role for the private sector. Recommendations are made related to:

- 17.1. External transaction advisor driving the PPP procurement process in addition to a strategic PPP advisor assisting the GoV
- 17.2. Capacity building in all components of the PPP life-cycle
- 17.3. Stakeholder management
- 17.4. Organizational review of WWDC
- 17.5. Diversify and increase waste water tariffs

18. Finally we have prepared a road map with key milestones for moving forward the priority projects on a PPP basis.