European experience on how to prepare and select cost-efficient and affordable water solutions applying Life Cycle Costing on project preparation

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Urban infrastructure investment needs during the next 25 years

- Water: $22.60 trillion
- Power: $9.00 trillion
- Road and rail: $7.80 trillion
- Air and sea ports: $1.60 trillion

Total: $41 trillion

Source: UNEP City Level Decoupling 2013

Global infrastructure development and reconstruction needs based on global urbanization trends
Trillion: 1,000,000,000,000 (one million million; 10^12)
Water infrastructure

- The oldest
- The most essential
- The most expensive
- The least appreciated
- The longest life cycle
The elements of Life Cycle Cost

Investment (construction, purchase) — Operation, maintenance — Replacement — External costs

External costs (indirect, negative social economical and environmental effects)

In the water industry the negative external effects appear only occasionally (e.g.: construction period) and only locally (e.g.: wastewater treatment plants), and on social level their strength is significantly weaker than the one which positive external effects have.
Life cycle approach—International outlook

• Well researched and widespread scientific literature (from the 1960’s)
• Several guidelines, manuals and recommendations
• Practical references and experiences from all over the world (eg.: Germany, Canada, England, South-Korea etc.)
• Several methodologies and tools
Cost efficiency / Option analysis - infrastructure developments

the proper tool for „selecting least-cost projects in Water Supply and Wastewater Disposal” is EWA DCC guide

http://www.dwa.de/dwa/shop/produkte.nsf/1A34AF1A8F92595DC12579A4001ECE52/$file/vorschau_DCCC-Guidelines.pdf
Dynamic Cost Comparison (DCC)

Main principle of (DCC)
For the correct evaluation of cost-efficiency, all costs of the whole life cycle should be taken into account, and cost should be compared on their present value.

- Life-cycle approach
- Dynamic approach
- Considers all costs
- In line with EU methodological guidelines
- Well-established, professional, transparent
- Mutual language of engineers and economist
What is LCC about?

- Proper understanding of cost-efficiency
- Economical knowledge to engineers, non economists
- Facilitate interdisciplinary approach
- Improve communication among stakeholders
- Improve transparency of decision-making process
- Bridge between science and practice
- Adequate tool for applying life cycle approach at the right stages of the planning and the preparatory process
Applying Life-Cycle Costing approach

In the case of FIDIC yellow book

DCC in option analysis!

Life Cycle Cost as evaluation criteria in public procurement!

100% ability to influence costs
Special characteristics of water services

- Public service, quasi public goods
- Cost-based (authority) pricing
- Long life assets
- Far reaching affect of water investment decisions!
- Intergenerational cost sharing
- No return on infrastructure investments
- No cost recovery

WATER:

PRICE of service < COST of infrastructure < VALUE of water
Water infrastructure challenges and opportunities

Challenges
• Climate change - Water scarcity
• Urbanisation - Infrastructure scarcity
• Financing initial investments
• Financing operation and reproduction
• Aging infrastructure
• Increasing requirements

Opportunities
• knowledge sharing and cooperation
• benefit from new concepts like Circular economy
• Resilient infrastructures
• „right water to the right user”
• economic development
• new jobs
• significant savings on social level (tap water vs. bottled water)
• 3T: Tariffs, Taxes, Transfers
Challenges of EU water sector

• Further development needs
  – Legal compliance (e.g. UWWTD 50-300 bnEUR!)
  – New regulations (e.g. EU ROADMAP Strategic approach to pharmaceuticals in the environment!)

• New concepts: circular economy, water reuse, resource efficiency, resilience,

• Pricing of water: cost recovery vs. Affordability? >> 3T (tariff, tax, transfer)
  – „... lack of harmonised and operational concept of cost recovery.” (EEA report on cost recovery No.16/2013)
Solutions for water challenges

- **Good practice of investment planning**
  - Dynamic Cost Comparison (DCC)
    - Life Cycle Costing (LCC)
    - Option analysis

- **Affordability:**
  The three ultimate ways to finance water services: the 3T’s (OECD methodology)
  - Tariffs: price of water services, including environmental taxes on the water bill.
  - Taxes: national, regional or municipal general taxes.
  - Transfers: money coming from another sector/country

- **Selecting least cost solutions**
Methodological developments and capacity building

- changing legal framework
- social changes, urbanization
- further development needs
- ageing infrastructure
- ageing professional community
- non-effective, non-efficient decision-making
- unaffordable, unsustainable water service

A change of mind set is needed in order to adopt changes and meet challenges!
Income-proportional overhead costs (Hungary, 2012)

Income-proportional overhead costs

Source: Hungarian Water Utility Association (HWUA) KPMG study

Statistical office data
Pricing of water services

- User/Polluter pays principle
- full cost recovery !/?
- economy of scale
- affordability, and solidarity
- the hidden economy of alternative solutions (jar<<>>bottle)
- comparison with other utility services (energy, telecommunication, transportation)
Investing in water infrastructure – investing life

The Multiplier Effect of Investing in Water

Investing US$1 million in water supply and sanitation infrastructure:

- 10-26 jobs in the USA
- 100 jobs in Latin America

Investments in infrastructure and operations of water-related services can provide high returns for economic growth and for direct and indirect job creation.
Thank you for your kind attention!

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