the international water association

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REGIONAL WORKSHOP

CIRCULAR ECONOMY

25th of May 2023, Sibiu - Romania

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BARRIERS AND OPPORTUNITIES IN INTEGRATING WATER MANAGEMENT AND WATER RELATED INFRASTRUCTURE DEVELOPMENT INTO THE CIRCULAR ECONOMY IN HUNGARY

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chairman

25th of May 2023, Sibiu - Romania

Content

Role of water in the circular economy

Circular Economy Technology Platform in Hungary

Importance of the life cycle approach in the field of the circular economy

Good examples

Messages to take

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WATER = the basis for effective climate adaptation.

What can we do to put this into practice?

What are the roles and responsibilities of each actor?

bcsdh
Magyarországi Üzleti Tanács a Fenntartható Fejlődésért
Business Council for Sustainable Development in Hungary

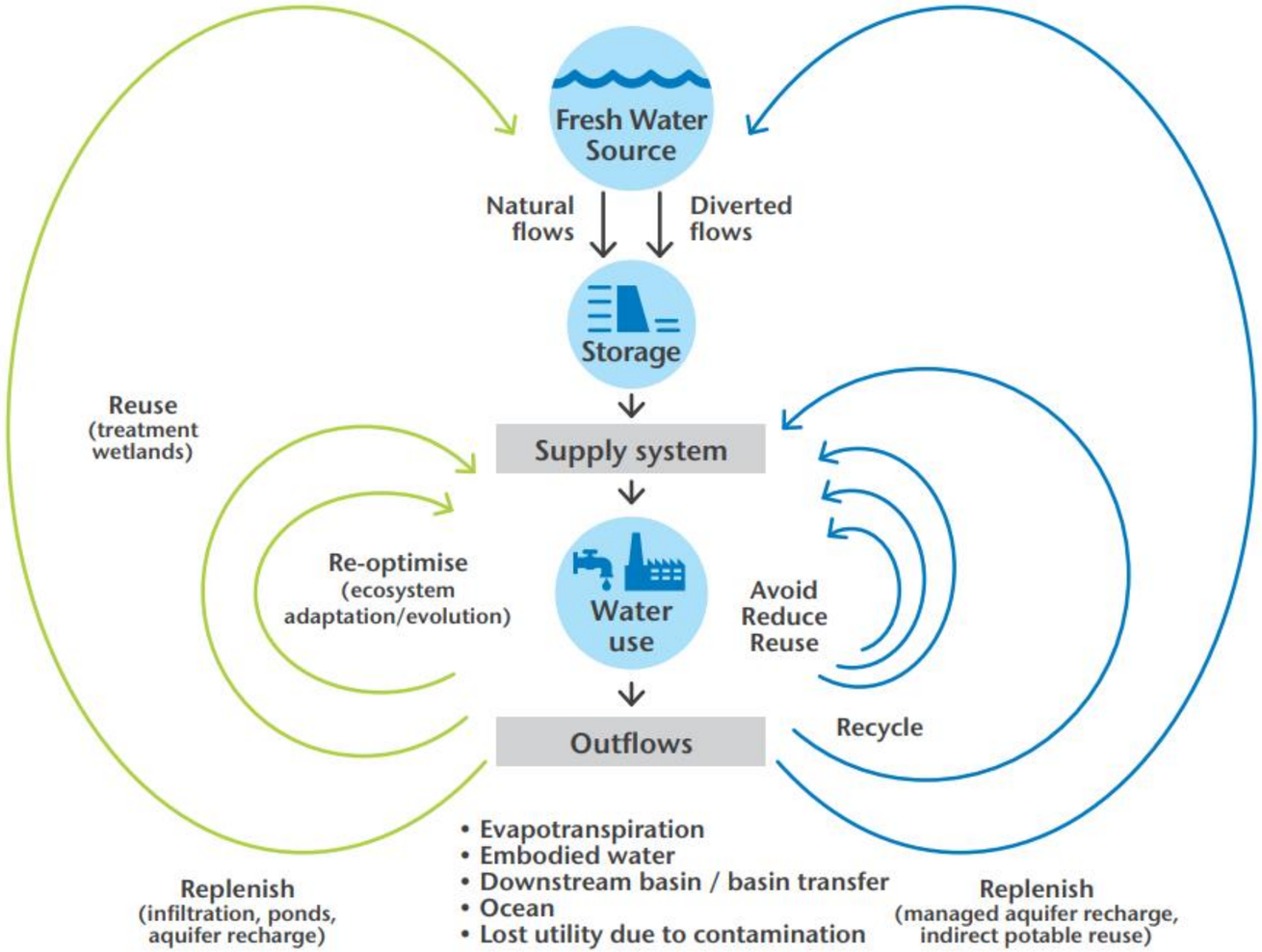
Action2020
led by the WBCSD

Let's start with the business sector:

Business Council for Sustainable Development in Hungary (BCSDH)

- Action 2020
- Research among their members
- Having water-smart strategies in the focus.

https://action2020.hu/wp-content/uploads/2015/11/Action2020_2019_ENG.pdf



Source: Ellen MacArthur Foundation

A circular approach to water management – how to put it into actions?

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CIRCULAR HUNGARY | Körforgásos Gazdaság Technológiai Platform

Accelerate the transition to a circular economy

Connecting actors and creating and strengthening their circular link

Providing a permanent professional, collaborative and consultative forum between market, academic and professional stakeholders in the circular economy and public authorities.

Running working groups to develop joint technical plans, formulate common positions, and initiate projects and activities, involving stakeholders involved in the transition to a circular economy.

Circular water management workshop

Registered companies, stakeholders:	47
Number of the registered particpants:	67
Number of the workshop meetings:	5
number of project proposals submitted:	16

Thematic breakdown of project proposals:

- solution-hardware type projects
- methodology-software type projects

The target areas of the proposed circular water management projects

- Keeping water resources in circulation
- Partly industrial pollutants/reuse as secondary raw materials
- Recovery of municipal wastewater treatment by-products
  - agricultural sludge recycling
  - energy recycling, partly by H2 production
- Utilisation of thermal energy
- Water and wastewater management
  - strengthening its climate friendliness
  - improving cost efficiency

Projects
Development of filtration technology for thermal water used for energy and irrigation
Recycling of industrial wastewater
Fertiliser production from wastewater
Recycling wastewater from battery factories
Energy self-sufficiency of wastewater treatment plants through supercritical aqueous gasification of sewage sludge - low-carbon hydrogen production
Recycling of dewatered sewage sludge from sewage treatment plants: creation of fertiliser through controlled composting
Returning sewage sludge to the soil after composting
Separation of sewage sludge, transport to collection point, onward transport in the system
Recovery of sewage sludge through composting
Agricultural irrigation with wastewater and the use of WaterGuide
Improving the economic efficiency of the wastewater treatment plant in Székesfehérvár (Hungary) through improved use of the biogas produced, indirectly reducing greenhouse gas (carbon dioxide) emissions, preventing the use of fossil energy sources

Projects
Developing an IT software and services package to support an operator-centric approach to operations
Decision support models for sustainable urban water management and innovative blue-green infrastructure development
Recovery of nutrients (nitrogen, phosphorus) used by agriculture from wastewater
Establishing integrated surface water management models in pilot areas

What would contribute to water cycling?

1. increasing the value of water
- increasing the value of water resources (now it is only 0.01 EUR/m^3)
- the inclusion of infrastructure costs in water charges

2. charges for stormwater drainage and treatment

3. introducing and strengthening a life-cycle approach regarding the developments

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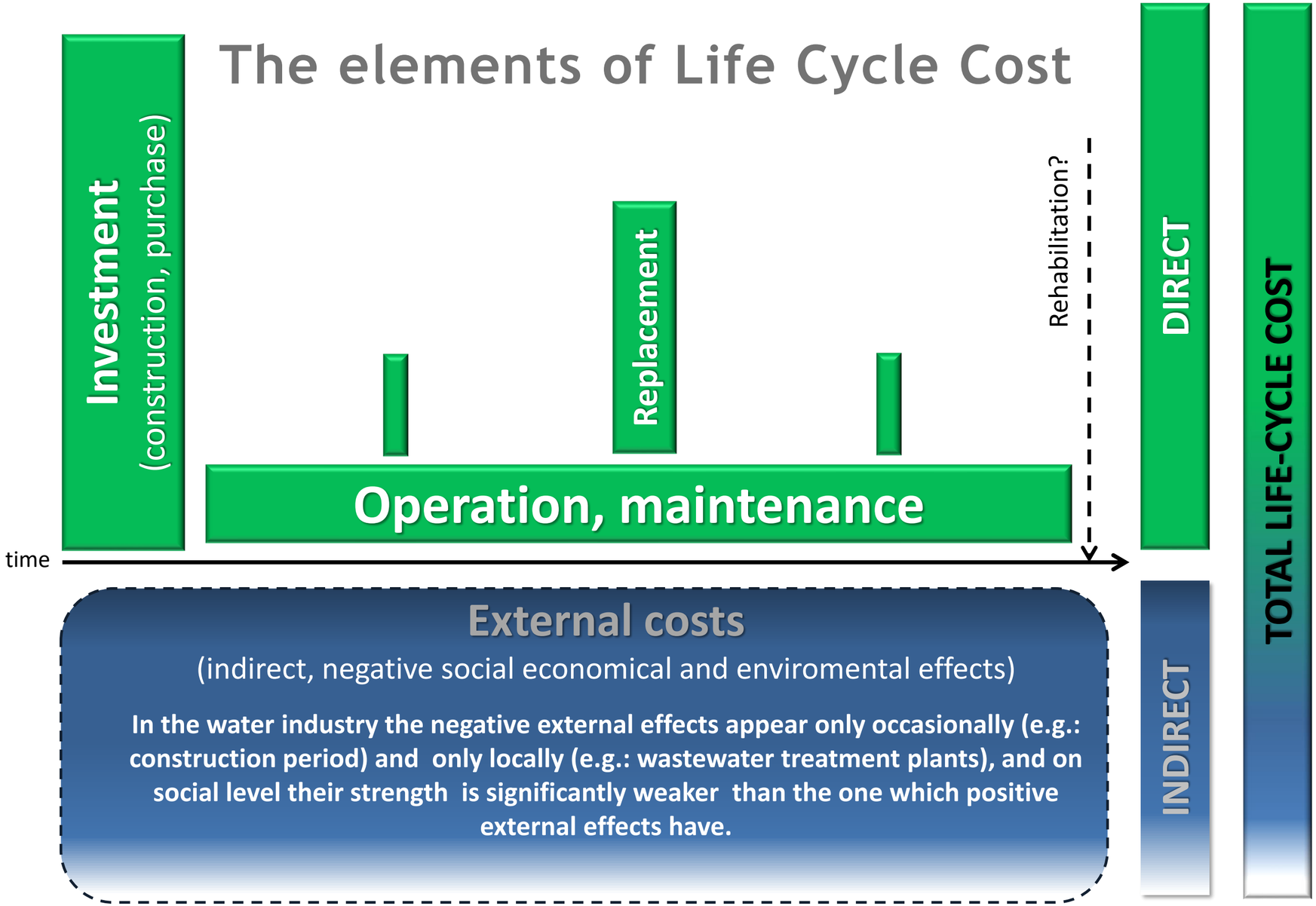
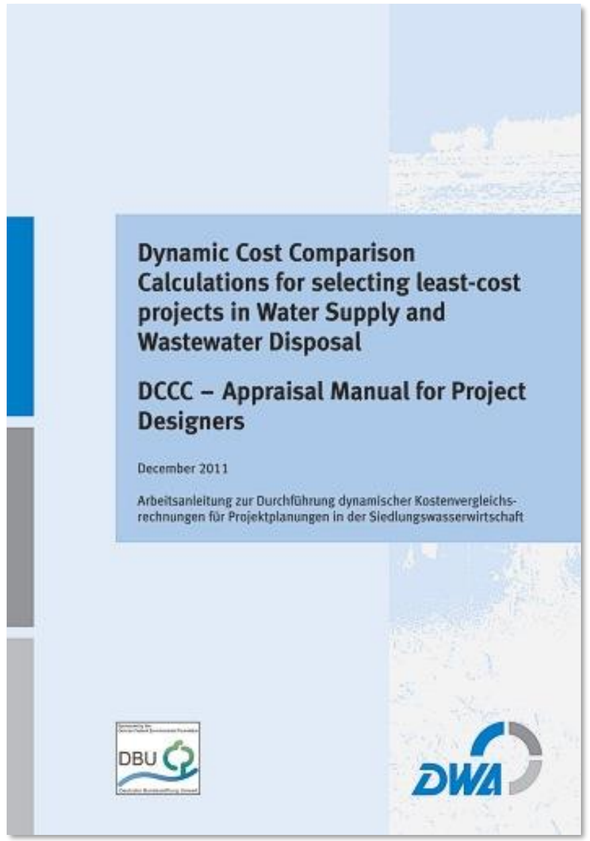
The elements of Life Cycle Cost



External costs

(indirect, negative social economical and enviromental 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.



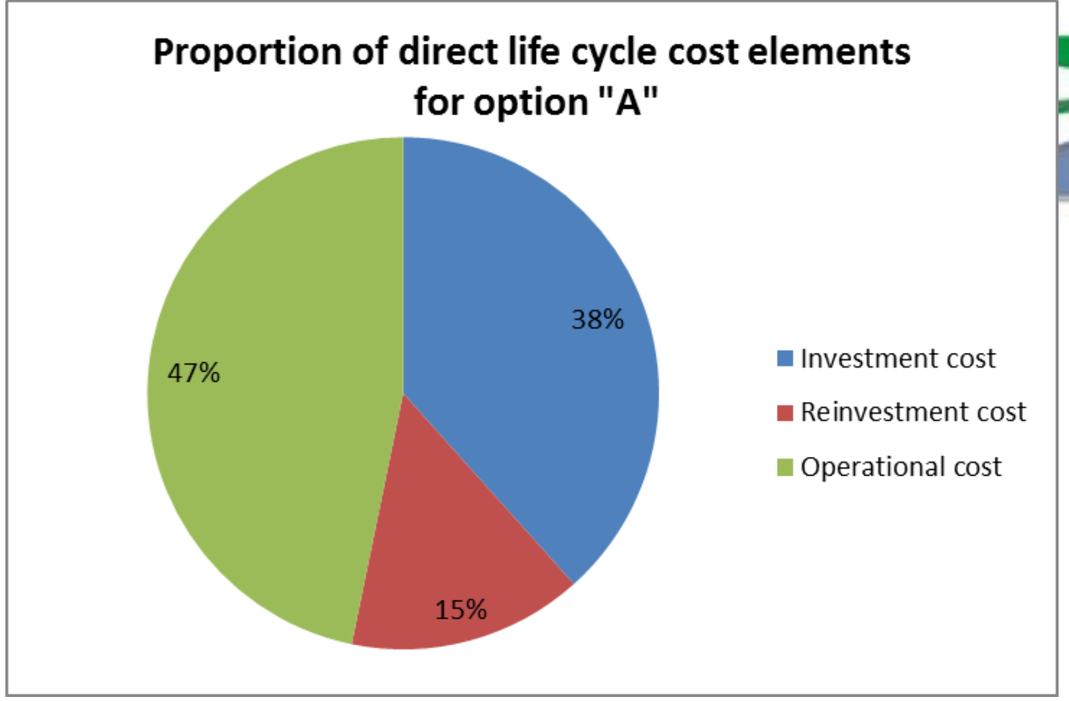
The life-cycle approach in the field of water technology development supports circularity

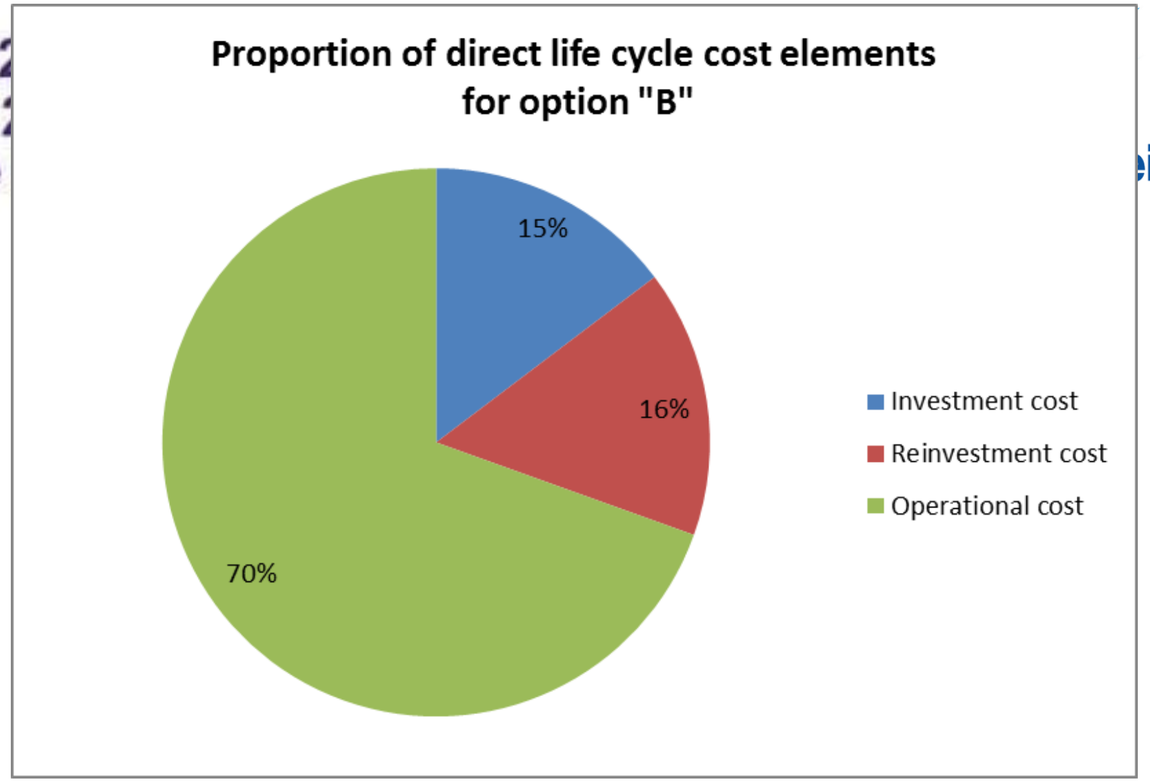
Take arsenic removal as an example: three technologies for arsenic removal:

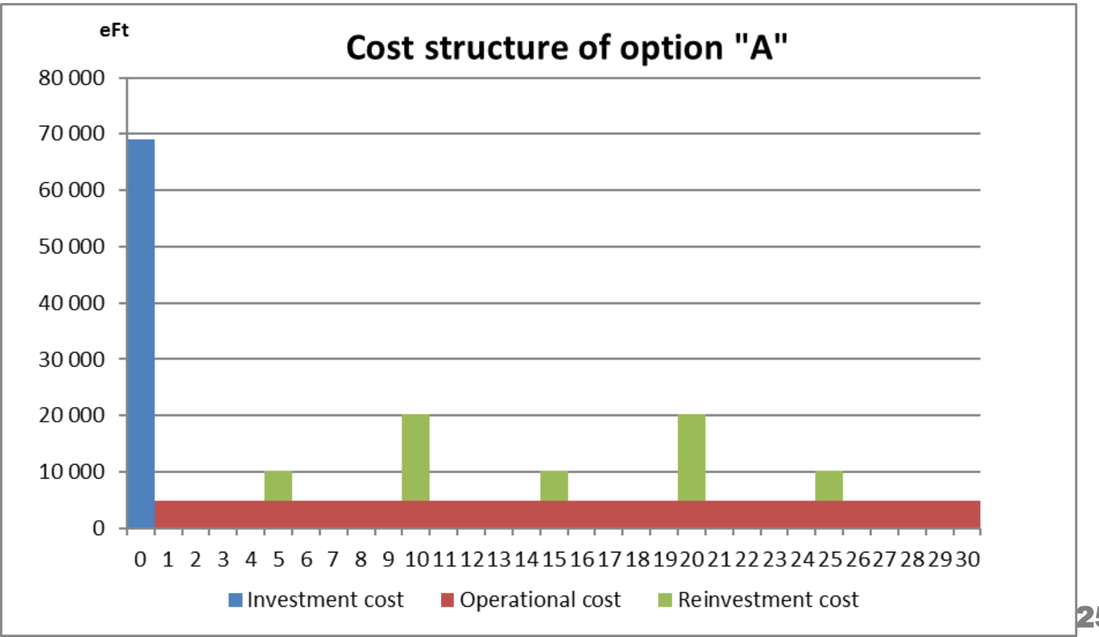
1. coagulation (e.g. iron sulphate dosing)
- % of hazardous waste generated by the use of the technology: 35%

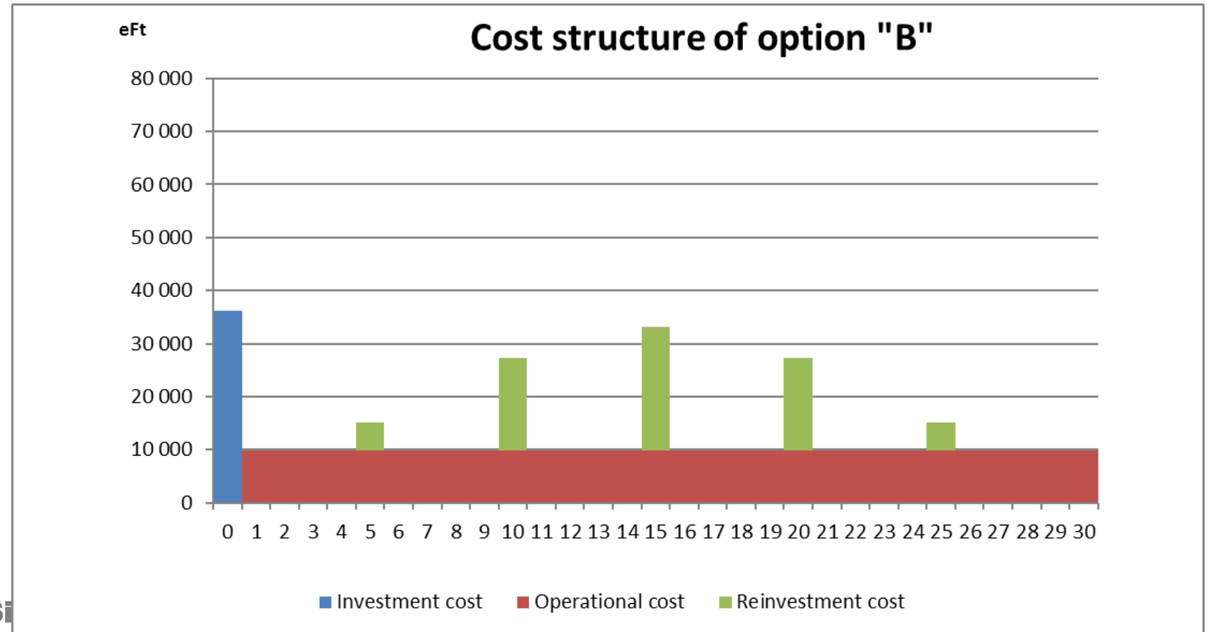
2. iron hydroxide based single use adsorbent
- % of hazardous waste generated by the use of the technology: 100%

3. regenerable adsorbent based arsenic removal
- % of hazardous waste generated by the use of the technology: 10%

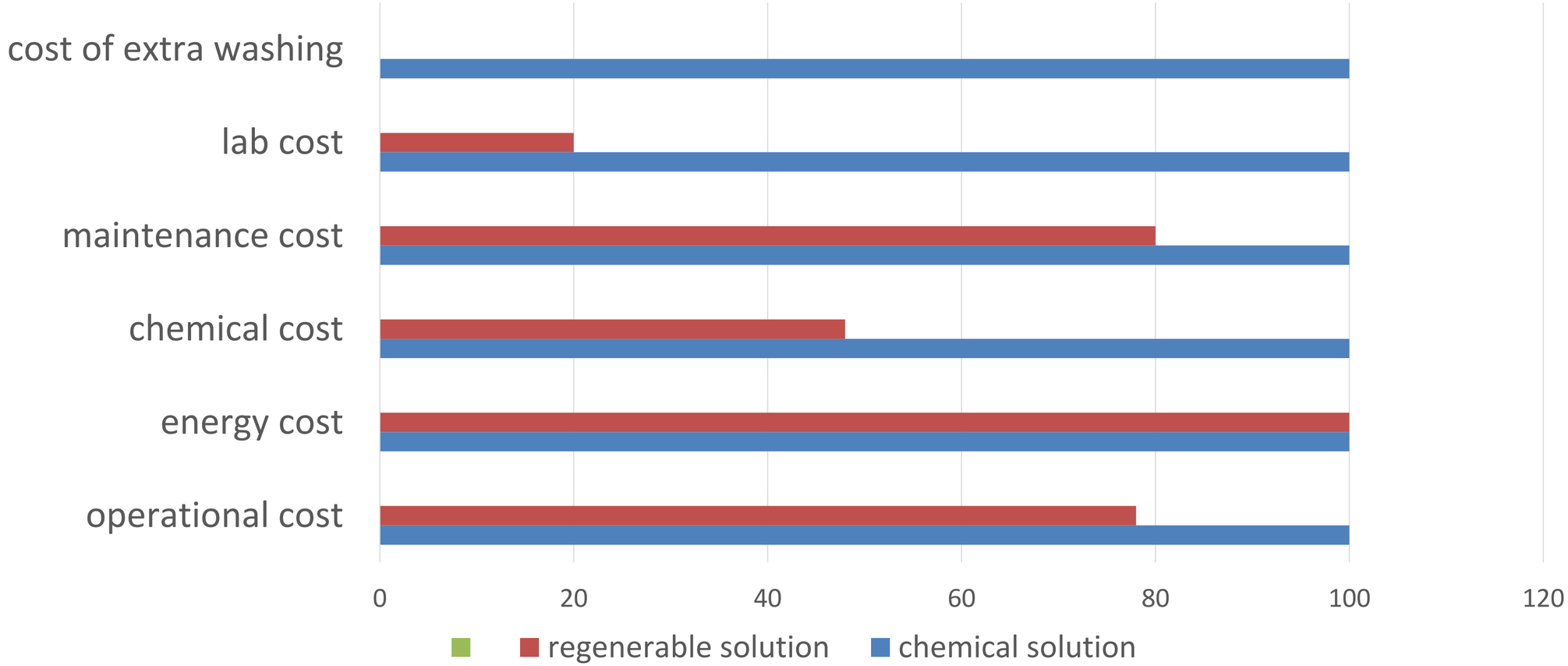

Proportion of direct life cycle cost elements for option "A"
38%
15%
47%
Investment cost
Reinvestment cost
Operational cost


Proportion of direct life cycle cost elements for option "B"
15%
16%
70%
Investment cost
Reinvestment cost
Operational cost


eFt
Cost structure of option "A"
80 000
70 000
60 000
50 000
40 000
30 000
20 000
10 000
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Investment cost
Operational cost
Reinvestment cost


eFt
Cost structure of option "B"
80 000
70 000
60 000
50 000
40 000
30 000
20 000
10 000
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Investment cost
Operational cost
Reinvestment cost

Operating costs with iron sulphate and regenerable adsorbent technology (%))



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LCC-DCC related background work with professional organisations and institutions

- European Water Association
- International Water Association
- ASEM Water
- ICLEI
- Water Supply and Sanitation Technology Platform (WssTP)
- Water Allience
- Hungarian Chamber of Engineers (MMK),
- Hungarian Water Association,
- Hungarian Water Utility Association (MaVíz),
- Hungarian Academy of Science
- Budapest University of Technology and Ecomomics (BME)
- IFAT LCC Symphosium recommedations:

  Link: http://www.ewa-online.eu/ewa-lcc-symposium-1792.html
- Budapest University of Technology and Ecomomics (BME)

Messages to take:

Water is the basis for effective climate adaptation.
Water is at the heart of the circular/green economy.

Tasks
Treating water value -- if we don't recognise it, we don't value it
Rethinking water use : recycling/ water-poor technologies/ alternative water sources/ storage/ water market
Taking life cycle approach into consideration.
Building the case for digital water management
Harmonising green and grey infrastructure
Knowledge sharing

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THANK YOU FOR YOUR KIND ATTENTION!

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