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Water Risk Management

Water Business Day

March 2018

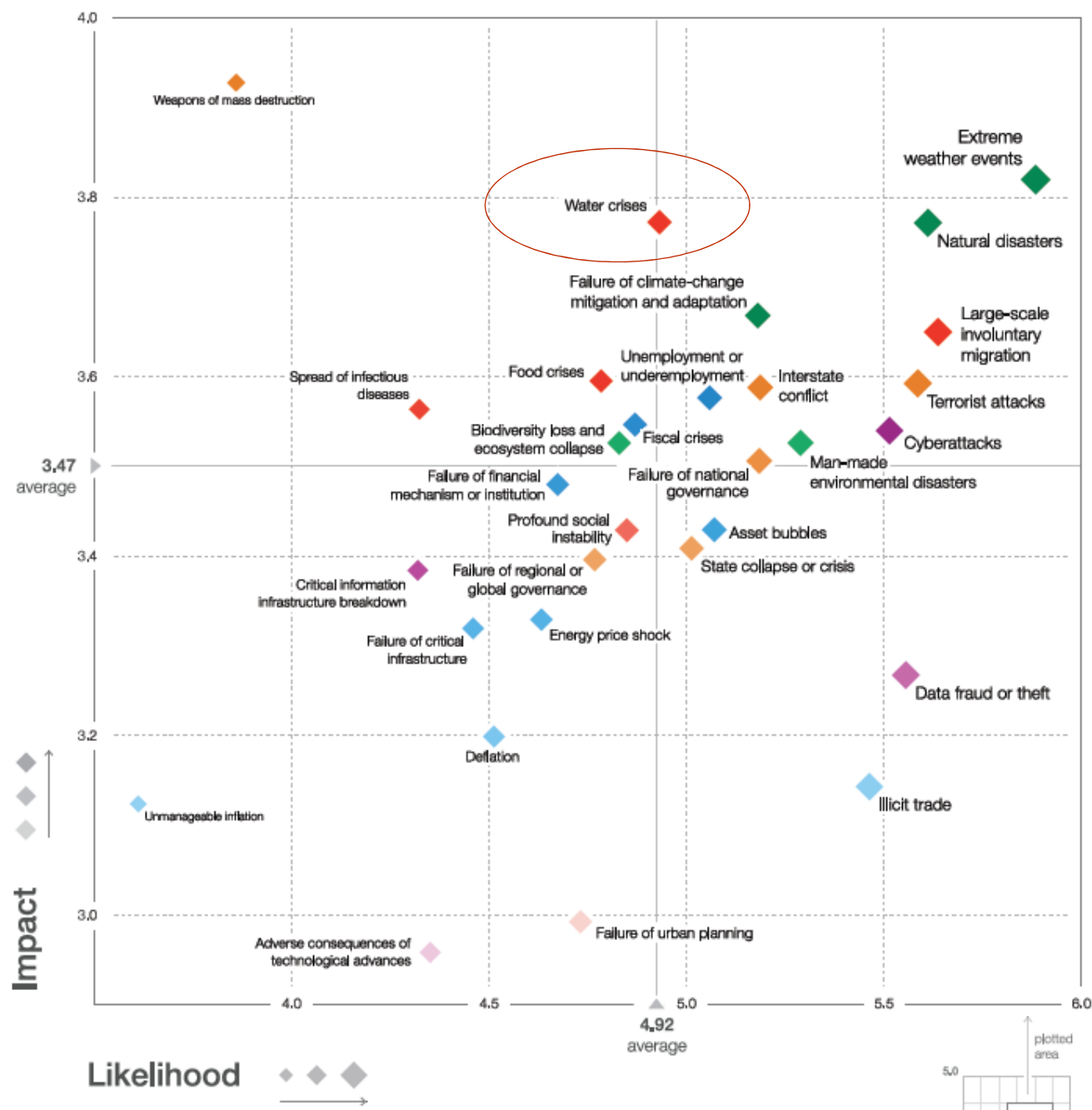


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“Next to iron and energy, water is the most important commodity for steel industry.”

AISI (American Iron and Steel Institute)



Current Trends

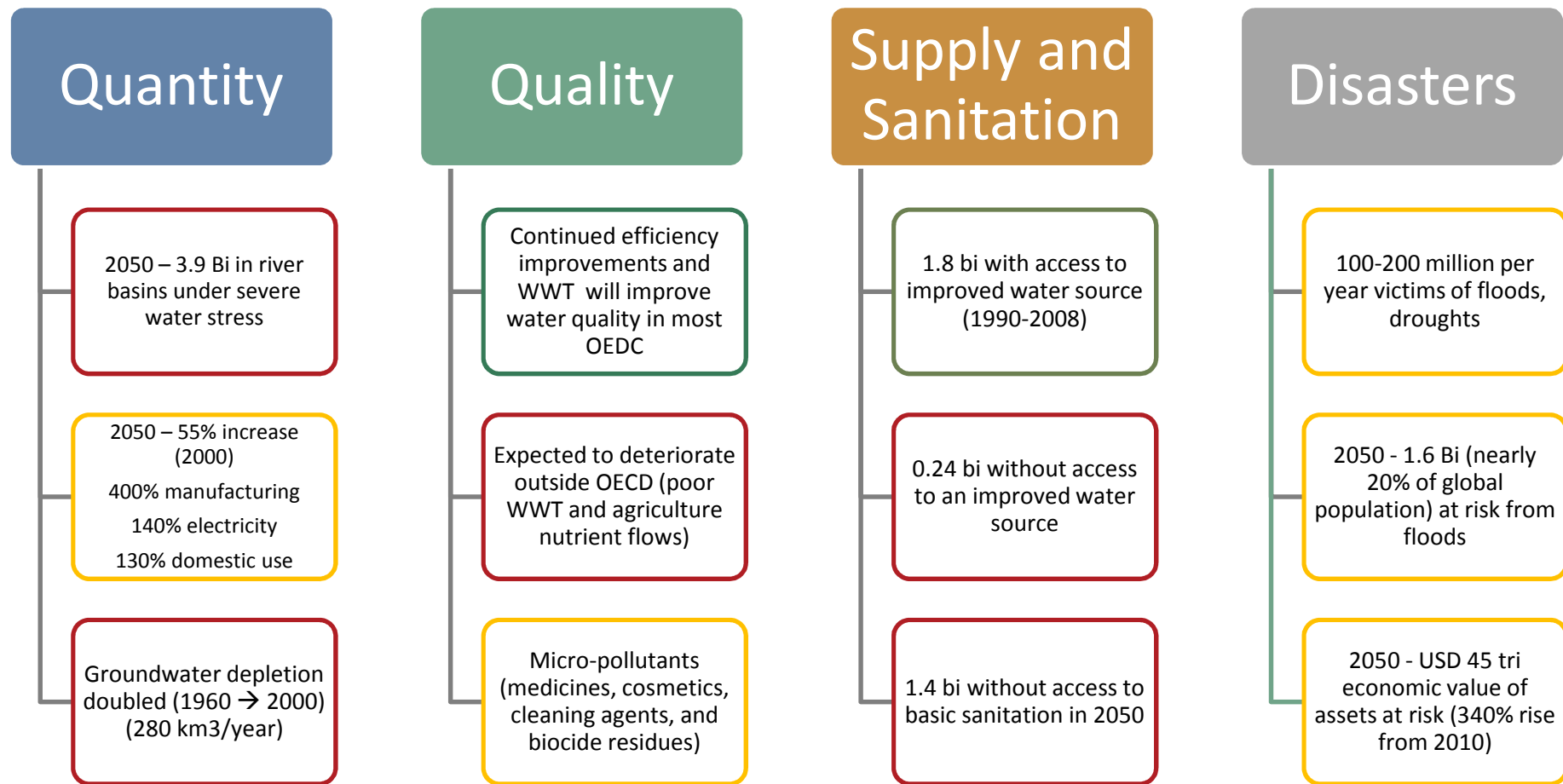


Figure based on: Leflaive, Xavier, *et al.* (2012), "Water", in OECD, *OECD. Environmental Outlook to 2050: The Consequences of Inaction*, OECD Publishing. http://dx.doi.org/10.1787/env_outlook-2012-8-en

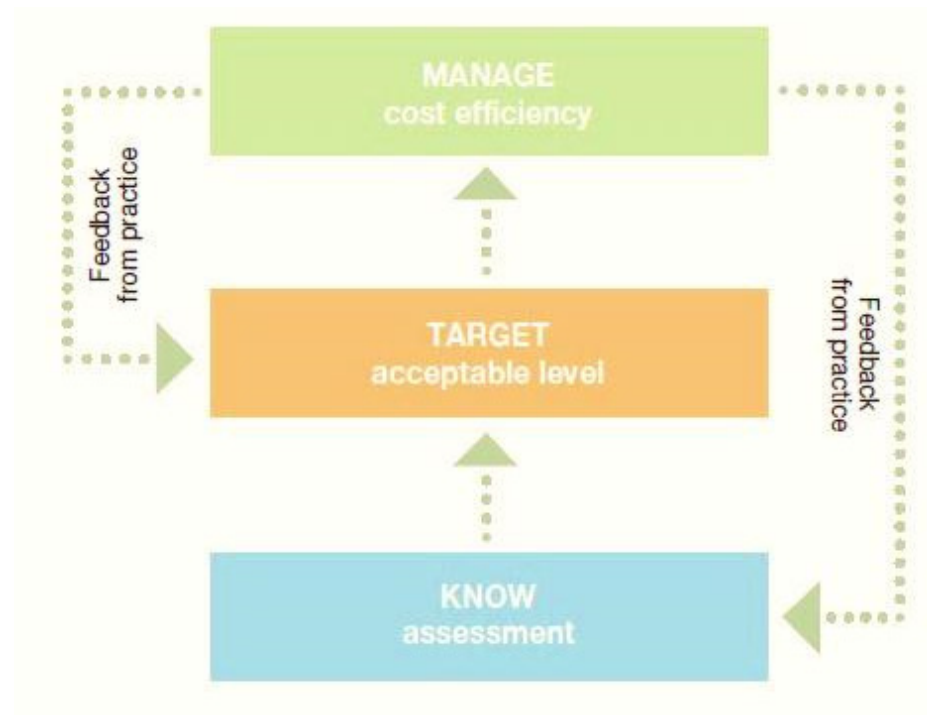
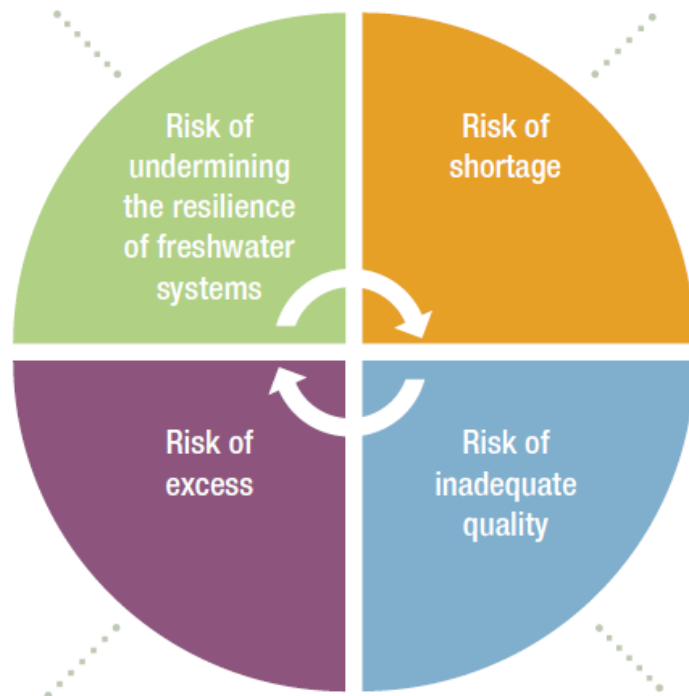
OCDE on Latin America

Given the relative abundance of water in the region, any 'water crisis' is more institutional than one in terms of physical availability

Dada a abundância relativa da água na região, qualquer crise hídrica é mais institucional que em termos de disponibilidade física

water risk is not only about shortage...

Water Risk Assessment



The future is uncertain. The risk approach encourages thinking systematically about uncertainty.

The level of assessment and governance should be proportional to the risk faced.

Quality issues



Piracicaba River – Jul/2013.



Piracicaba River - Jul/2014

Quality issues

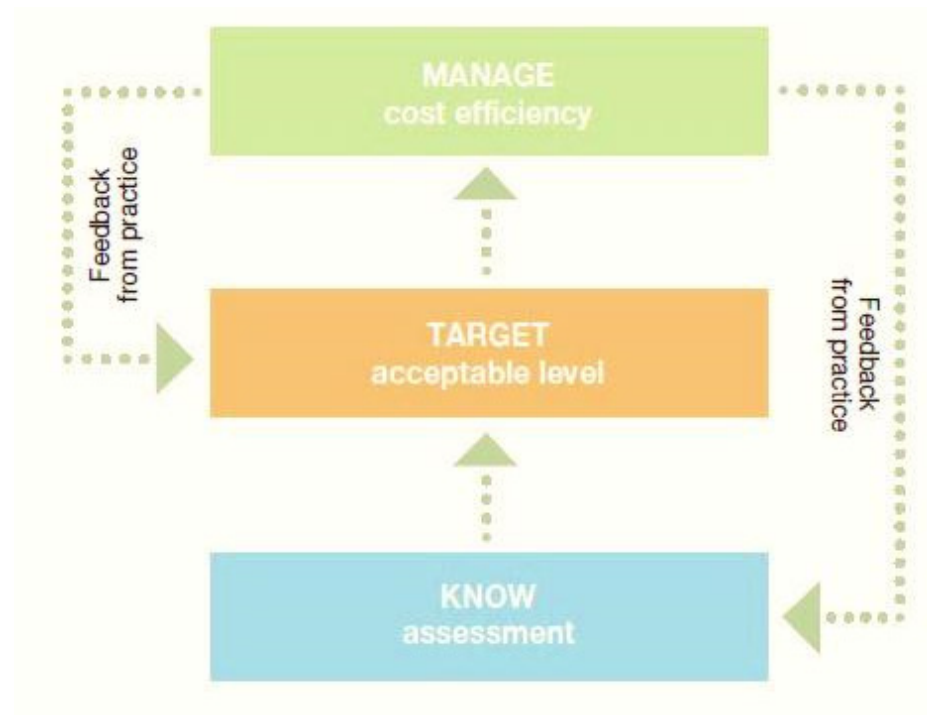
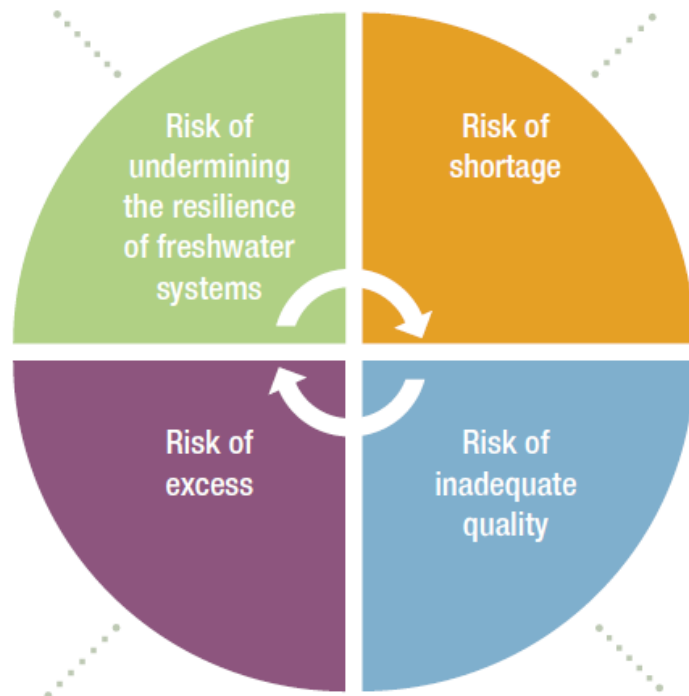
Parameters	Process max.	Average	Month 1	Month 2
Conductivity(us/cm)	500,0	326,3	602,64	807,46
Hardness (ppm CaCO ₃)	60,0	27,3	49,66	65,57
Hardness (ppm CaCO ₃)	48,0	18,5	31,63	44,57
Total Alkalinity(ppm CaCO ₃)	100,0	36,3	85,33	141,57
Sulfide(ppm)	50,0	31,0	31,55	25,67
Chlorides(ppm)	50,0	77,5	77,00	142,14
Turbidity (NTU)	3,0	0,9	0,67	1,11



ArcelorMittal Water Approach



Water Risk Assessment



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The level of assessment and governance should be proportional to the risk faced.

ArcelorMittal Water Approach



Water is a key resource for all our activities and its sustainable management is not only necessary to fulfill our environmental responsibilities: it is critical for most of our industrial activities, both in mines and steel plants.

Source: Internal files. ArcelorMittal R&D Asturias.

Global Outcomes

5. Trusted user of air, land and water

Introduction

Air

Land

Water

Without air, land and water, we have no economy, no society, no eco-systems. They are all essential resources for our business, but ones which we share with others. As the world's population grows, these resources are under increasing pressure. We must be trusted to use them and share them responsibly.

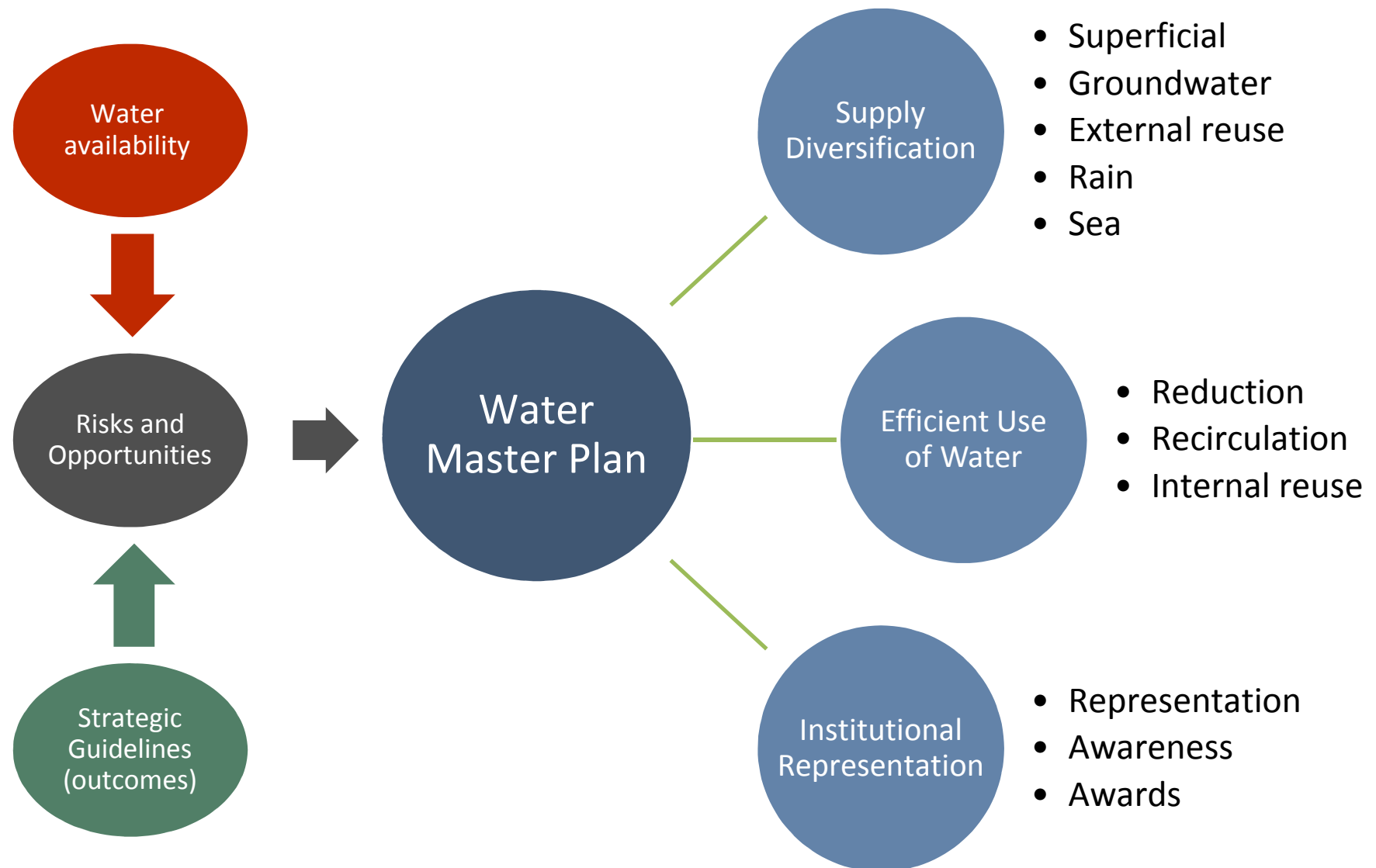


Our local communities and stakeholders trust us to share the vital resources of air, land and water, because we operate responsibly and transparently, and have clearly improved our impacts. We understand these impacts, and work collaboratively to protect and enhance the natural capital we and our communities and partners rely on.

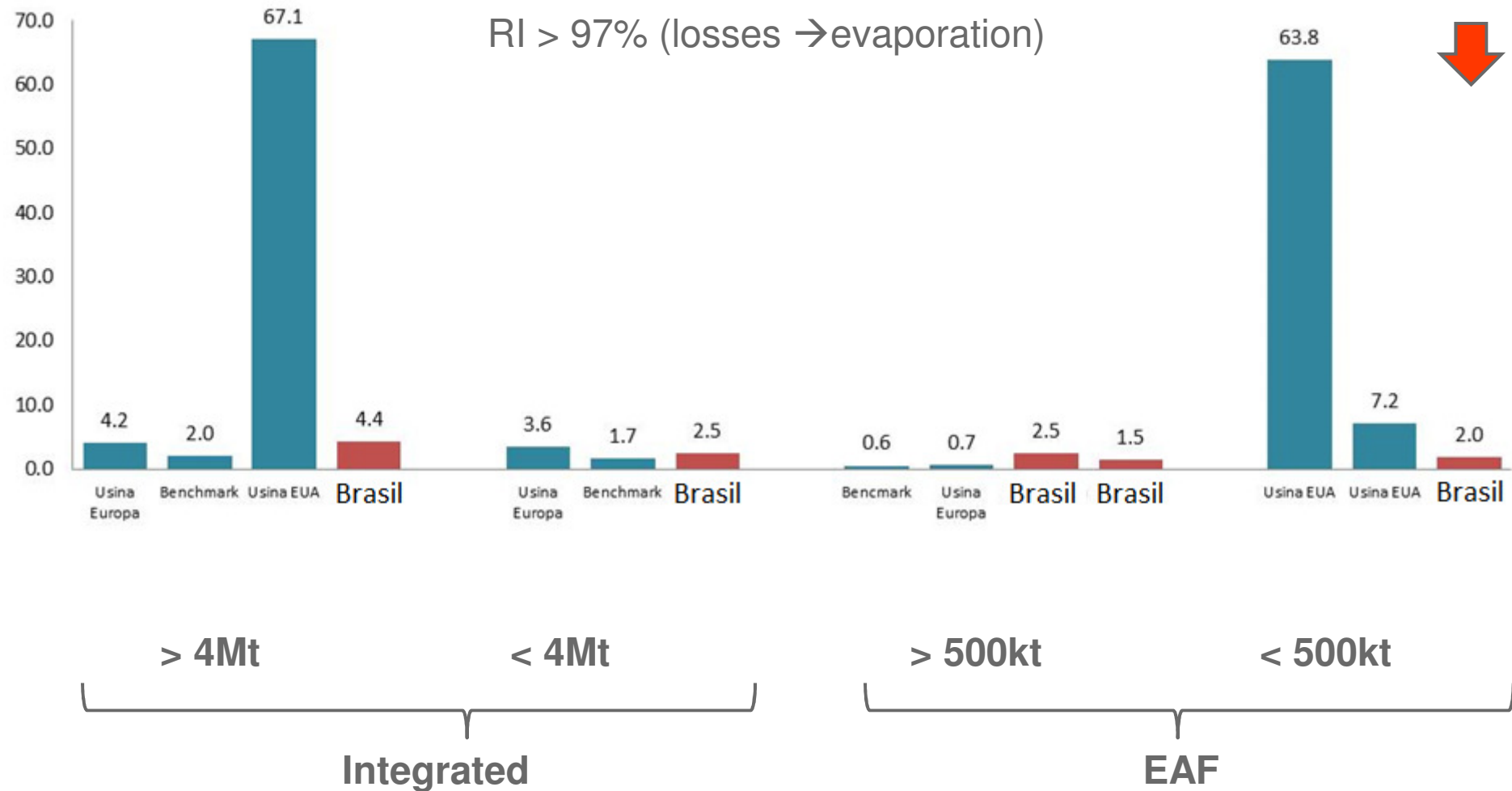
Water Master Plan ArcelorMittal Brasil



Water Master Plan



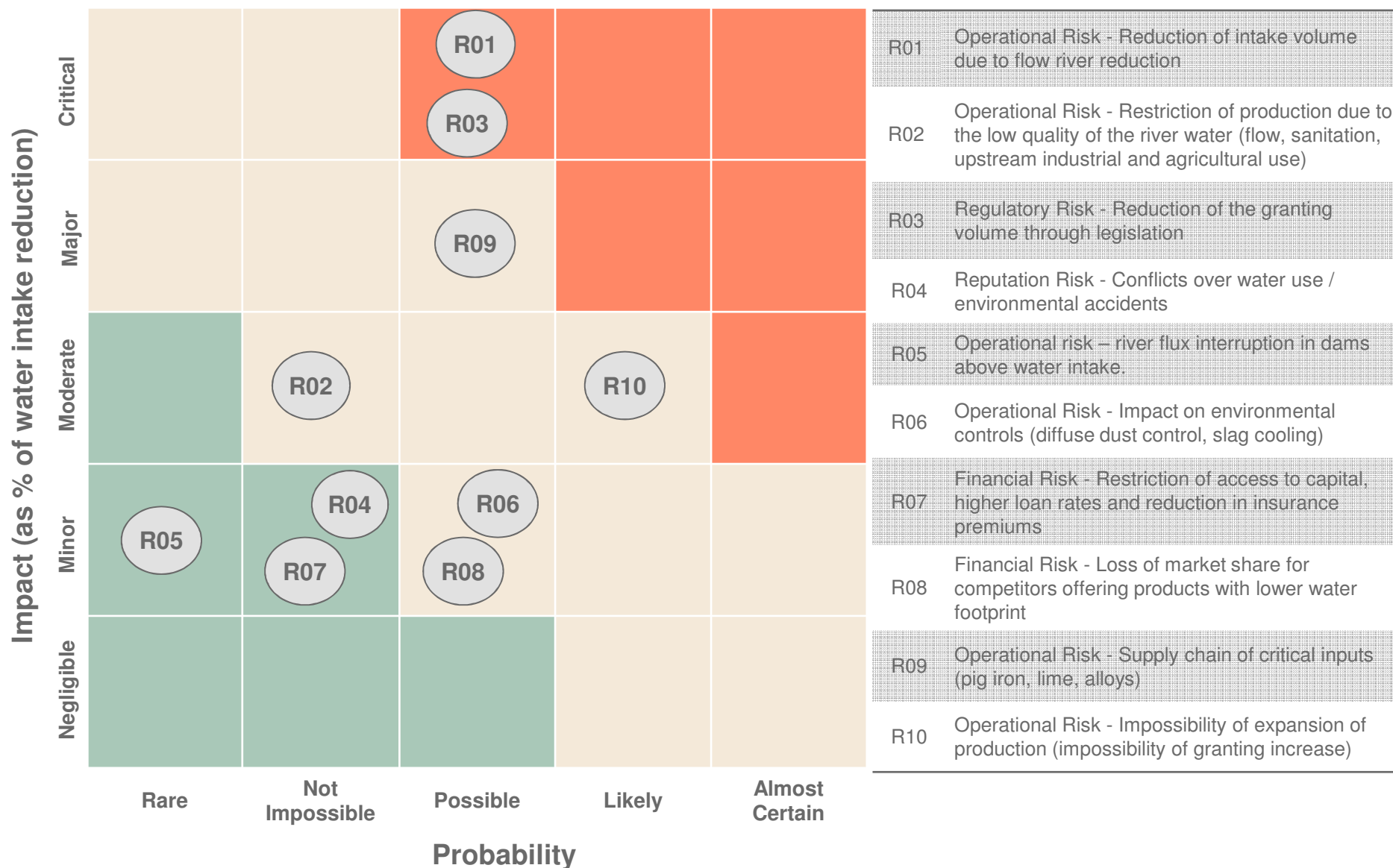
Water Specific Intake (m³/t)



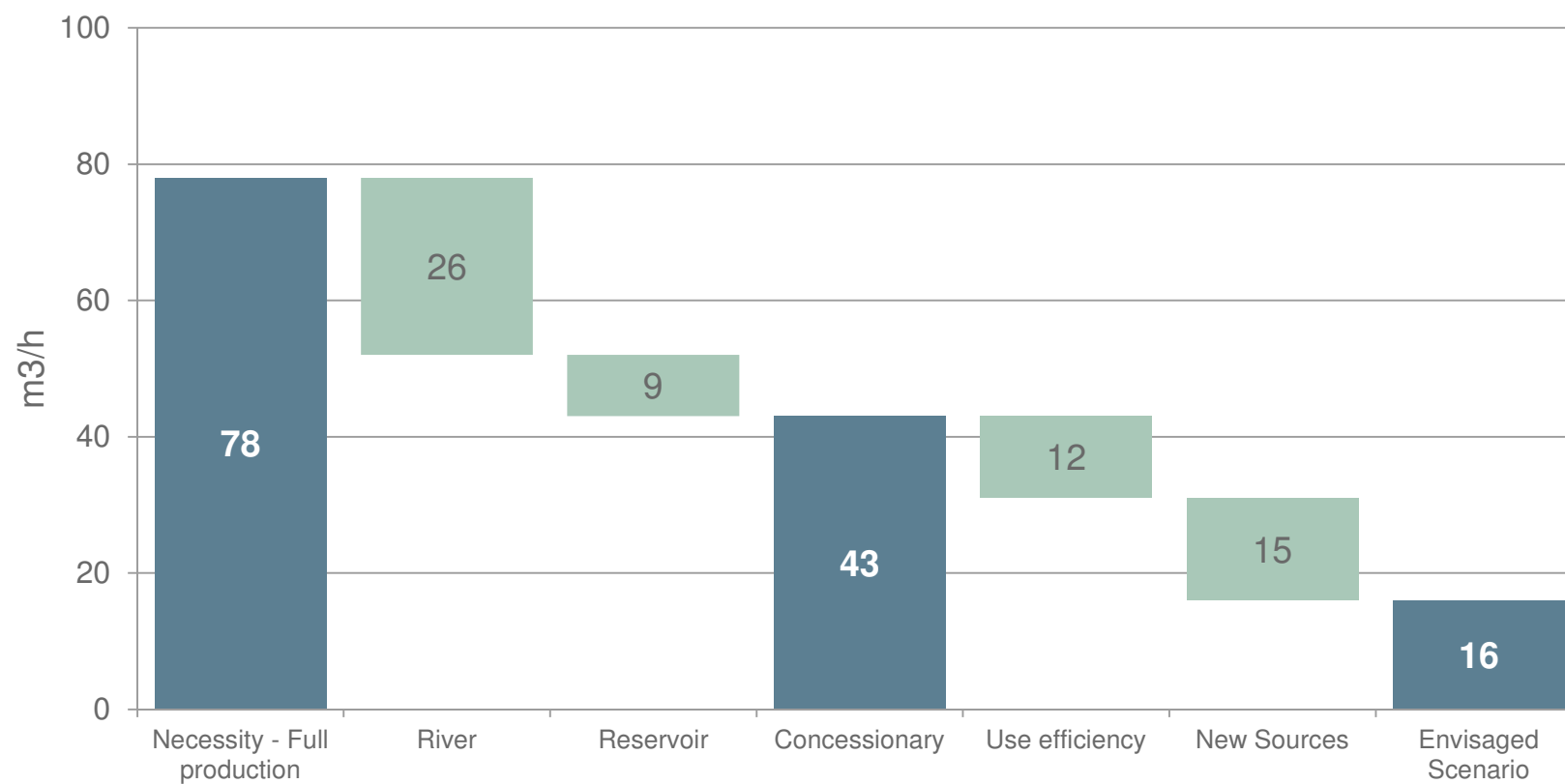


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Water Risk Matrix



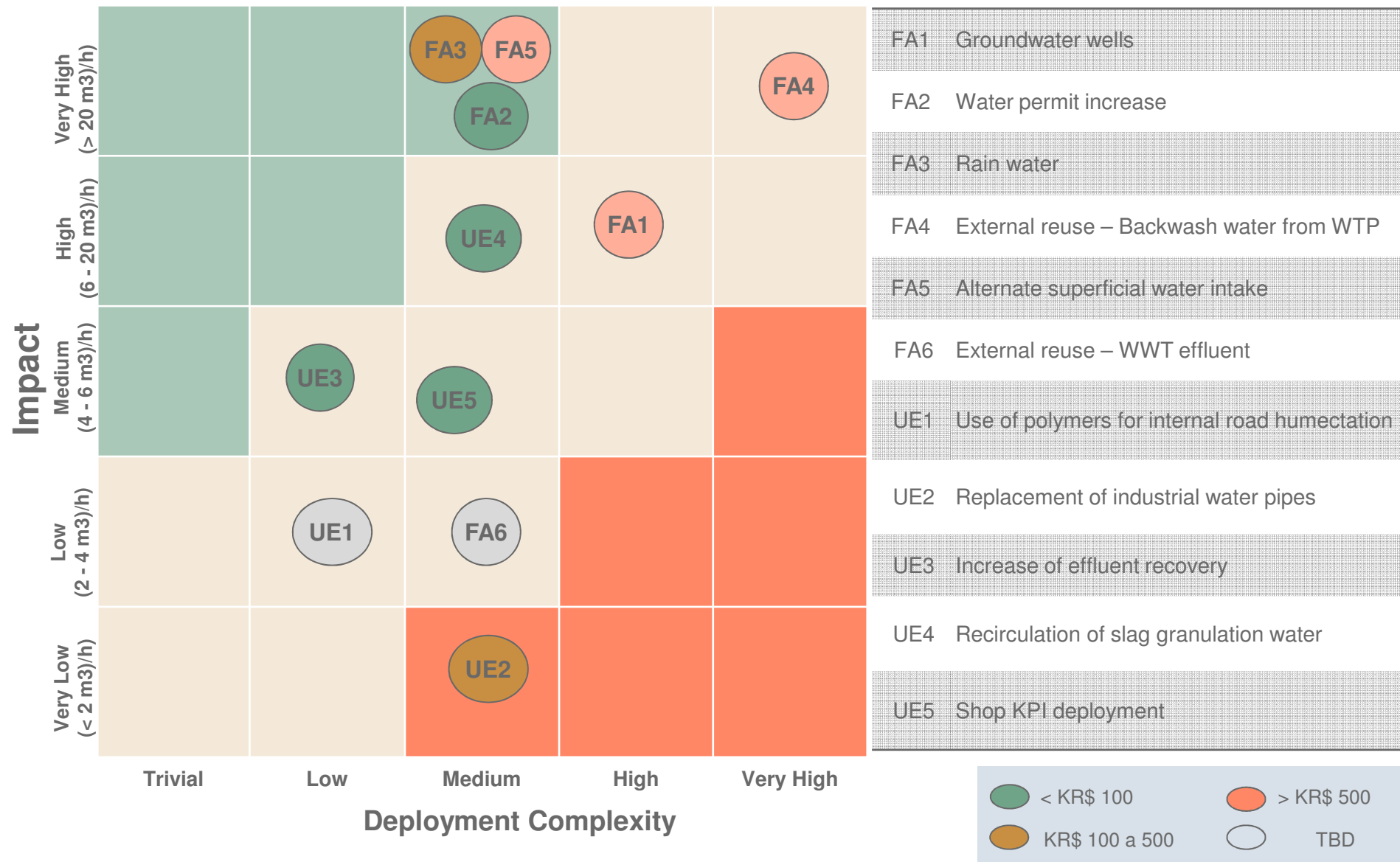
Site A – Envisaged Scenario



Opportunity Matrix



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Project Follow up

Membrane Bioreactor

Pilot Plant

- Site B

Category

- Water Optimization

Goal

- Improve effluent currently recycled but with high content of solids and oil

Expected gains

- 15 m3/h (better estimated necessary)

Budget

- Studies: k€ 20
- Pilot test: k€ 40

Participating Areas

- R&D Asturias
- R&D Brasil
- Environment & Utilities Brasil

Achievements

- Project not yet started

Comments

- Site B is the best plan in Brazil to test the technology since does not need a third party to be implemented
- Potential additional tests in other sites which have identified opportunities in using effluents for municipal water and wastewater treatment plants.

Project Status

- Waiting for GETC approval.

Risks

- Low since current effluent is either discharged or used in cooling systems that do not affect product quality

Design Changes

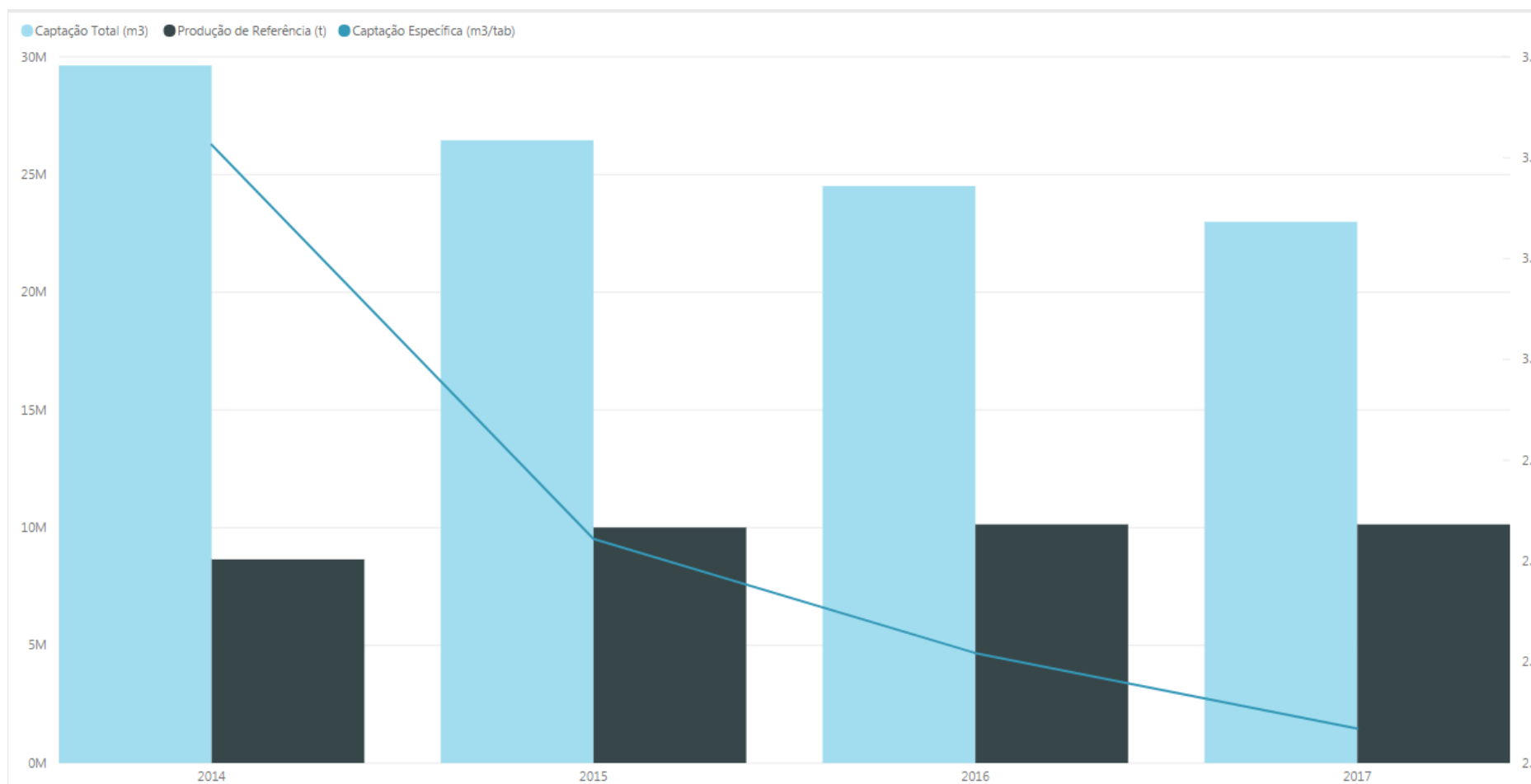
- Normal conception aims to treat domestic effluent to further discharge.

Timeline

1. Water systems description	C					
2. Characterization of "Zero discharge" effluent	NS					
3. Tests in R&D Asturias Lab	NS					
4. Preliminary report with Pilot Plant Design	NS					
5. Pilot Plant installation on site	NS					
6. Pilot Plant operation – Final Report	NS					
		1Q18	2Q18	3Q18	4Q18	1Q19

C - Concluded NS – Not started ON – Ongoing
 D - Delayed WA – Waiting Approval AT - Attention

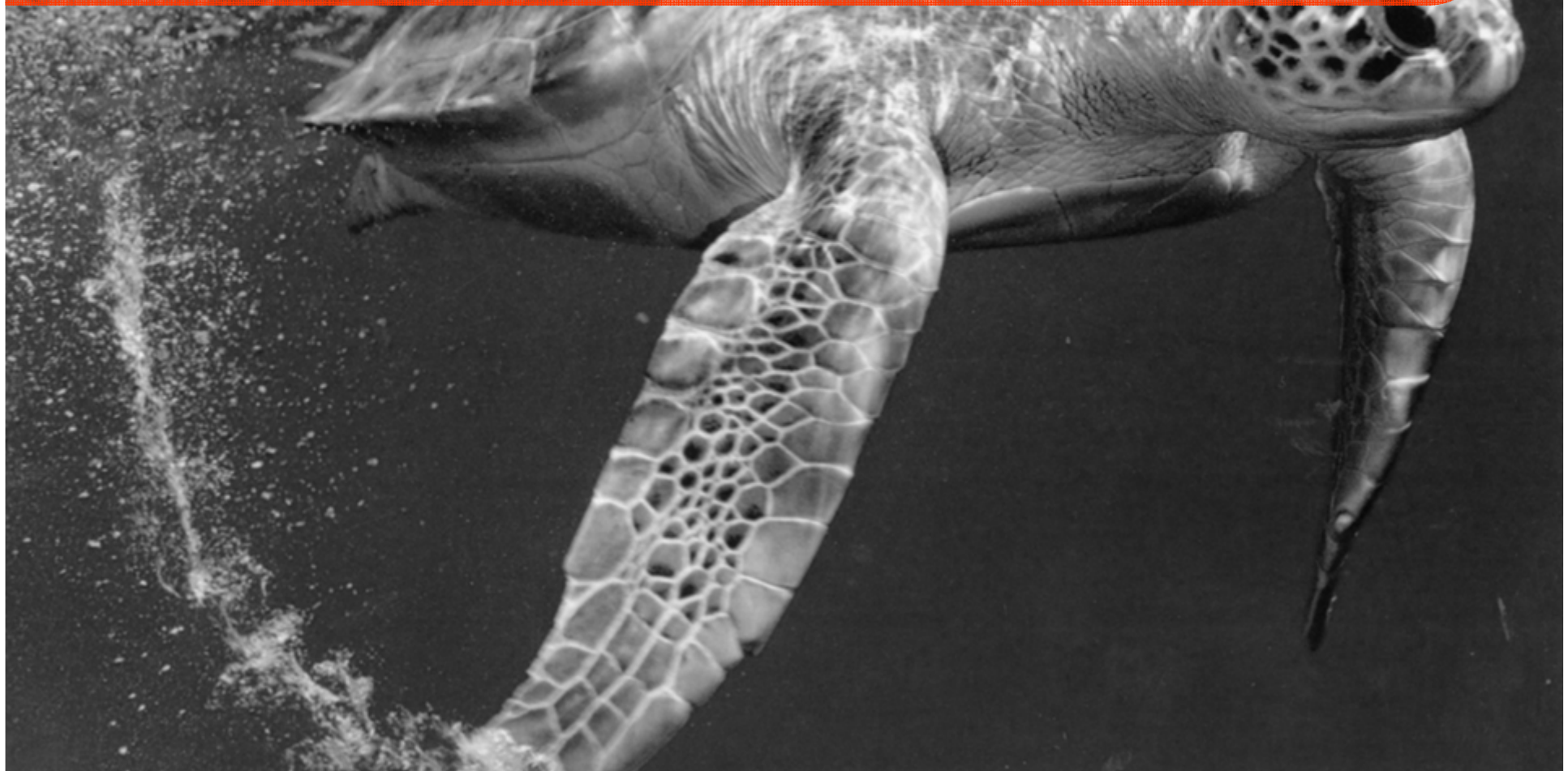
Results



Cool. But...

- How to measure the avoided risk?
- How well are we communicating water risks to high level administration?
- CAPEX → Water price? Cost? Value?
- Are KPIs correctly placed? Who should be in charge? How to deploy them?
- How to become a trusted user?
- Metrics in water basin – Water production?

Obrigado



Water Risk Assessment

