

Brazilian Sustainable Remediation Forum

Fórum Brasileiro de Remediação Sustentável



Brazilian Sustainable Remediation Forum

- First meeting held on October 18, 2010
- Founding members:
 - AECOM
 - BASF
 - CETESB (São Paulo State Environmental Agency)
 - DuPont
 - Shell/Cosan
- President: Sander Eskes (AECOM)

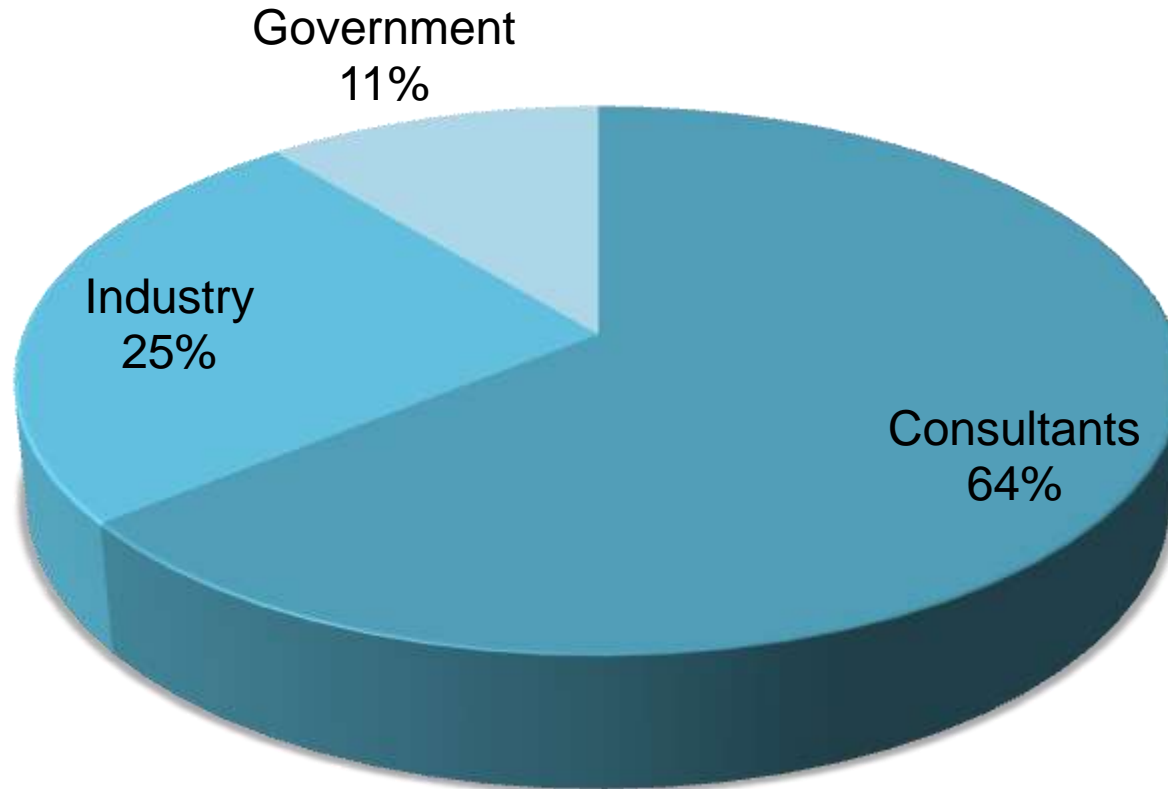
Brazilian Sustainable Remediation Forum (cont'd)

- Organization
 - Based on social networks – interactivity
 - Focus on knowledge transfer to external users (i.e., non-members)
 - Organized around discussion groups (technical, legal, etc.)
 - Meetings are held 3 times per year (discussion groups more often)
 - No formal organizational structure
- Interaction with government agencies and industry
 - Close cooperation with São Paulo State Environmental Agency (CETESB)
 - Limited interaction with industries through branch organizations
- Interaction with the public
 - Mouth-to-mouth advertising (advocacy)
 - Blog (mostly accessed over the weekend)
 - Social networks (Facebook / LinkedIn / Twitter)

Brazilian Sustainable Remediation Forum (cont'd)

- Policy making (state level)
 - Technical discussion groups
 - Legislative forums
- Key documents
 - White paper
 - Translations and adaptations of CLU-IN guideline documents (*www.clu-in.org*)
- Tools
 - AFCEE Sustainable Remediation Tool (SRT™)
 - Various carbon tools
 - Remediation cost estimation tools (RACER™, etc.)
 - Bow-Tie risk analyses tools (THEISIS™, etc.)

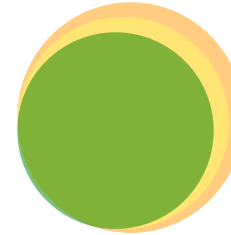
Forum participation



Members on distribution list (September 2012): 34

Milestones

- Selection of forum name and logo: Fórum Brasileiro de Remediação Sustentável (*Brazilian Sustainable Remediation Forum*) in January 2011
- Incorporation of sustainability concepts in São Paulo State Environmental Law 13.577, February 2011.
- Creation of an official blog in April 2011:
<http://foresbr.wordpress.com>
- Organization of a roundtable discussion and workshop on Sustainable Remediation at the CIMAS II conference in São Paulo, October 2011.
- Application of Bow-Tie technology (ongoing)



Fórum Brasileiro
de Remediação
Sustentável



Blog <http://foresbr.wordpress.com/>

Fórum Brasileiro de Remediação Sustentável

Fórum dedicado ao debate sobre remediação sustentável

INÍCIO APRESENTAÇÃO AGENDA DOWNLOAD LINKS ENQUETES COLABORADORES



Fórum Brasileiro de Remediação Sustentável



EPA Technical Documents and Tools Prepar

Publicado em [19/03/2012](#) | [Deixe um comentário](#)

EPA Technical Documents and Tools Prepared to Support Guidance Development | Vapor Intrusion | US EPA <http://ow.ly/gKlTp>

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#CETESB – Renovação na Câmara #Ambiental

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DEFINIÇÃO DE REMEDIAÇÃO SUSTENTÁVEL

“A REMEDIAÇÃO SUSTENTÁVEL é um conceito aplicado ao processo de GESTÃO de áreas contaminadas e fundamentado na busca do equilíbrio entre as variáveis econômica, social e ambiental”

EMAIL SUBSCRIPTION

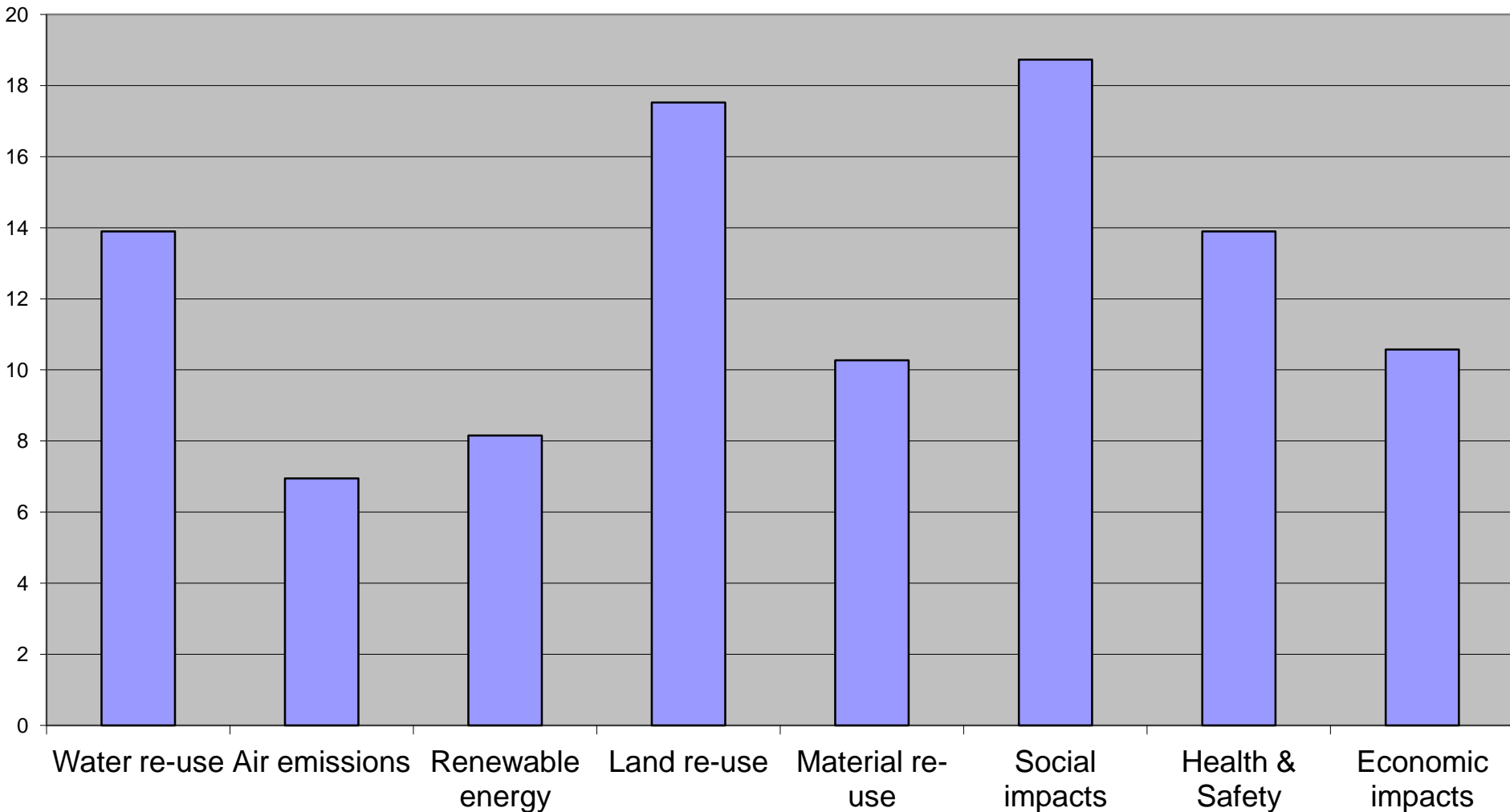
Você está seguindo este blog ([alterar](#)).

BIUSCA NO RI OG

Blog visitors since Jan 2011: 4000

What matters in Brazil?

Relative importance of Sustainable Remediation aspects in Brazil - Poll among 30 participants at a workshop in São Paulo - Nov 2011

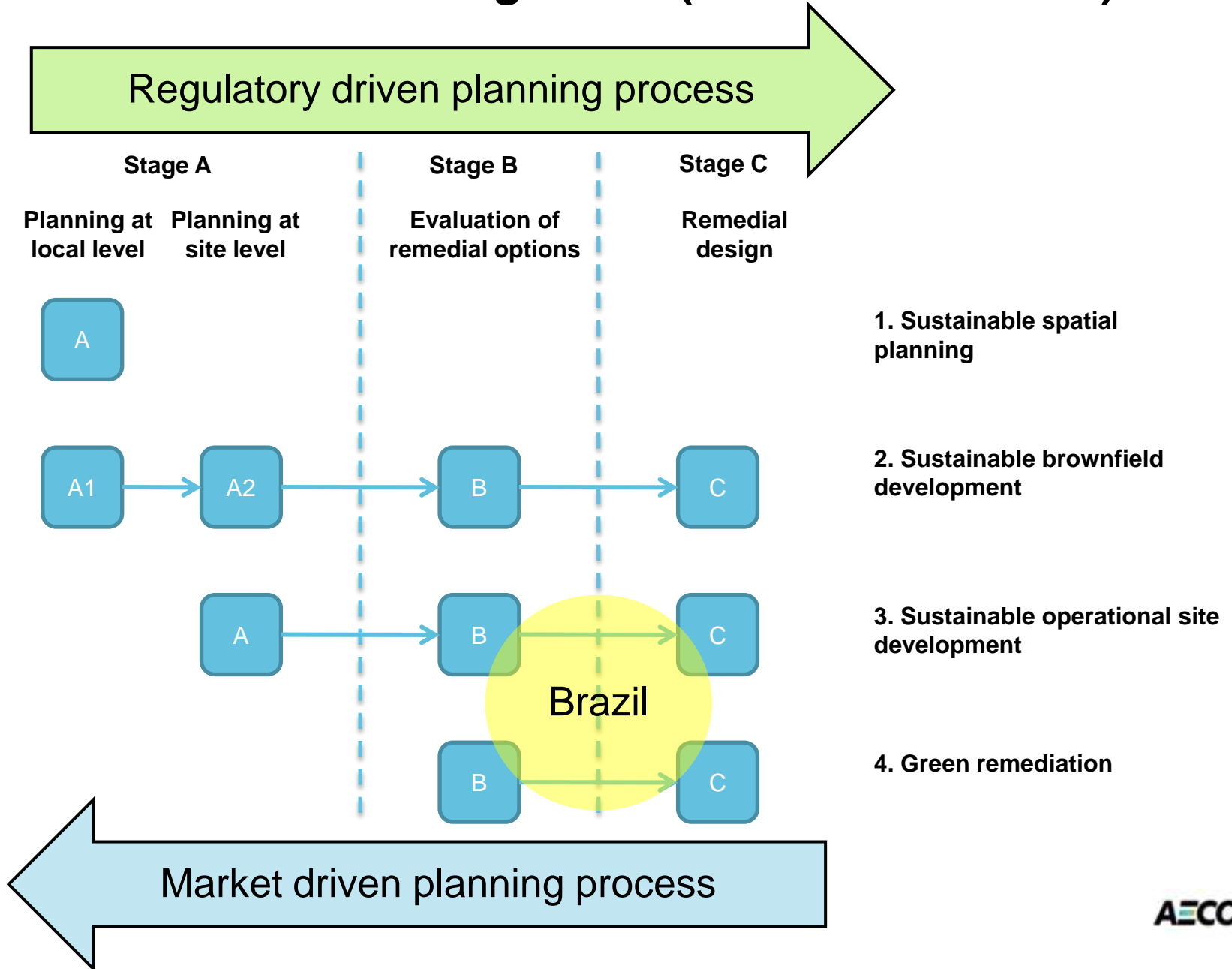


Key issues in Brazil

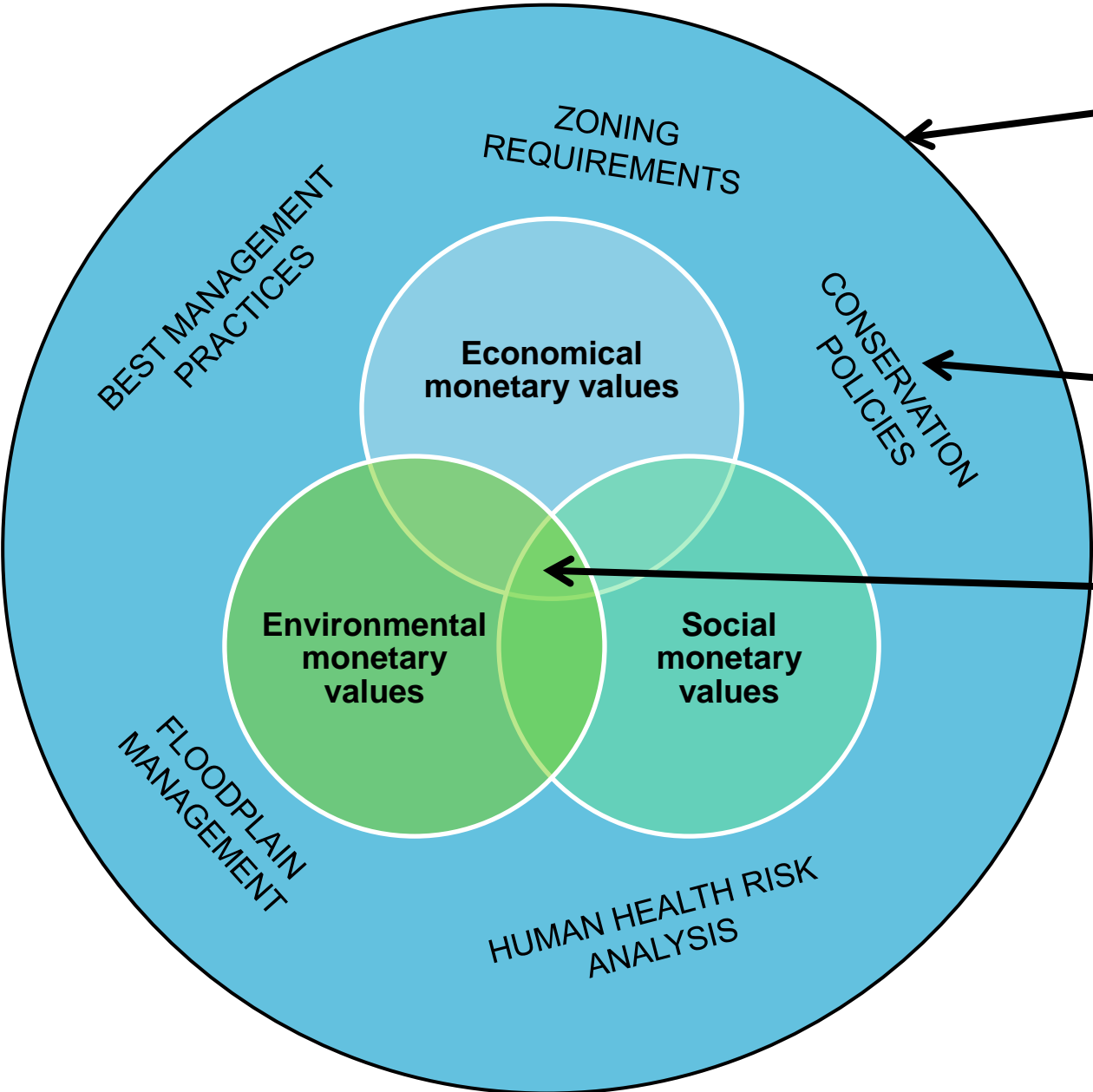
1. Social aspects
2. Land re-use
3. Water re-use
4. Health & Safety
5. Economic impacts

How to incorporate social aspects into sustainable remediation?

Sustainable land management (Source: SURF-UK)



Calculating the Monetary Value of a Remediation Alternative



Information used to define one **Remediation Alternative**

Boundary Conditions are attributed a monetary value of zero.

The monetary value of a remediation alternative is the sum of negative and positive monetary values of all three **Sustainability Legs**

Not all monetary values can be calculated directly...

•Economic values

-Negative(CAPEX, O&M, NPV, etc.) ► Calculate \$

+Positive (e.g., return on investment) ► Calculate \$

•Environmental values

-Negative

○ Water & energy costs ► Calculate \$

○ Ecological impacts ► Determine risk levels

+Positive

○ Carbon credits ► Calculate \$

○ Return from materials re-use ► Calculate \$

•Social values

-Negative (community impacts, H&S risks) ► Determine risk levels

+Positive (local benefits, benefits to society) ► Calculate \$

How to compare dollar values and risk levels ?

Proposed solution:

1. Determine the net monetary value of those aspects that can be calculated directly
2. For all other aspects, perform a Bow-Tie Risk Analysis and calculate the cost of managing the risk.

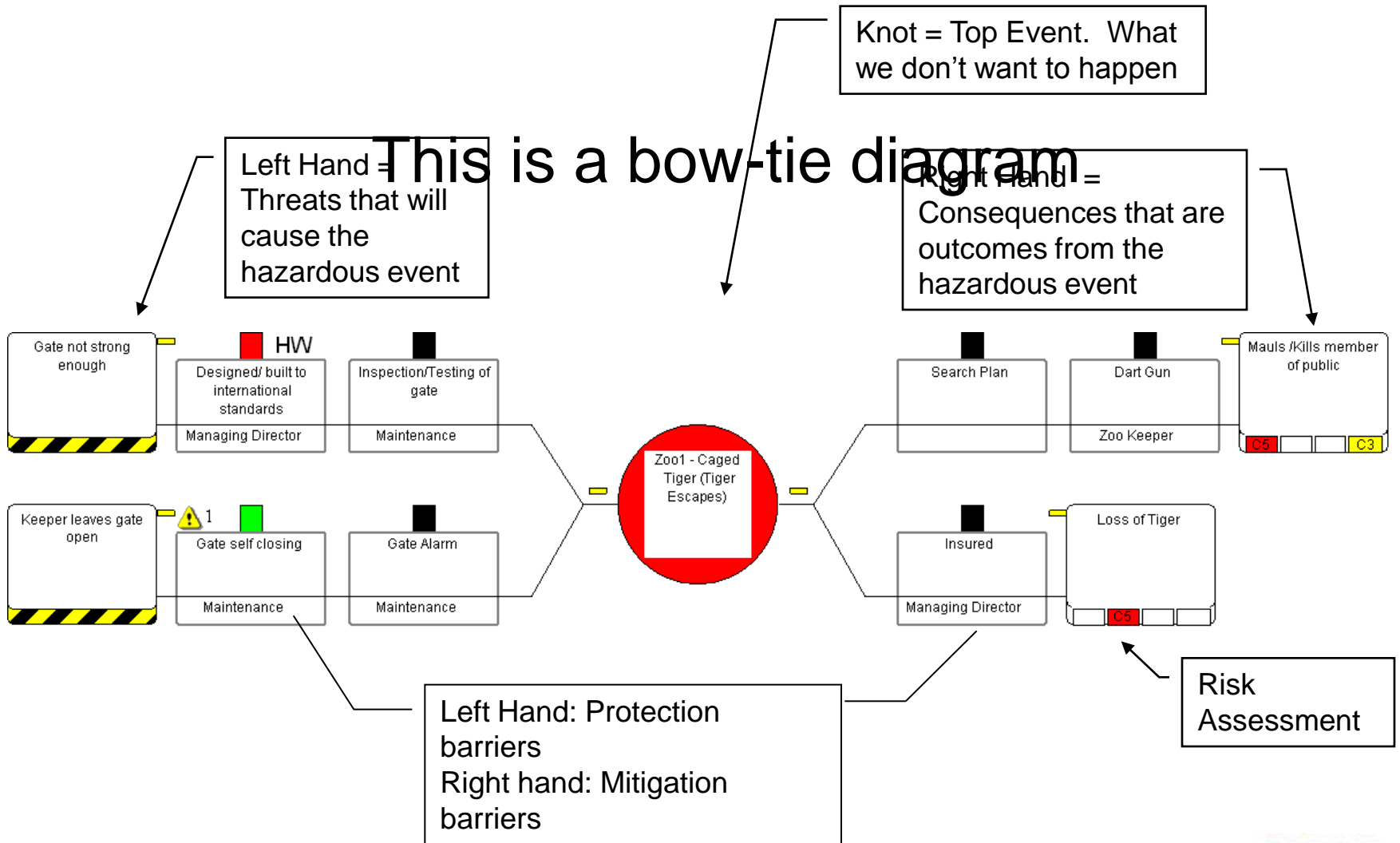


How is risk quantified?

- Statistically, the level of risk can be calculated as the product of a) the probability that harm occurs; and b) the severity of that harm.

SEVERITY	CONSEQUENCES				LIKELIHOOD				
	People	Asset	Environment	Reputation	1	2	3	4	5
					Very Unlikely	Unlikely	Possible	Likely	Very Likely
1	No/ Slight Injury	No/ Slight damage	No/ Slight effect	No/ Slight Impact	Low	Low	Low	Low	Low
2	Minor Injury	Minor damage	Minor effect	Limited Impact	Low	Low	Low	Medium	Medium
3	Major Injury	Local damage	Local effect	Major Impact	Low	Low	Medium	Medium	High
4	Fatality	Major damage	Major effect	Nat. Impact	Low	Medium	Medium	High	High
5	Multiple fatalities	Extensive damage	Massive effect	Internat. Impact	Medium	Medium	High	High	High

What is a bow-tie diagram?



Assessing the Risk

- The risk can be assessed by selecting a category from a risk matrix

The diagram illustrates the process of assessing a risk. On the left, a box labeled "Mauls /Kills member of public" contains a red "C5" and a yellow "C3" at the bottom. A red arrow points from the "C3" to a "Consequence" software window. The window displays a risk matrix with the following data:

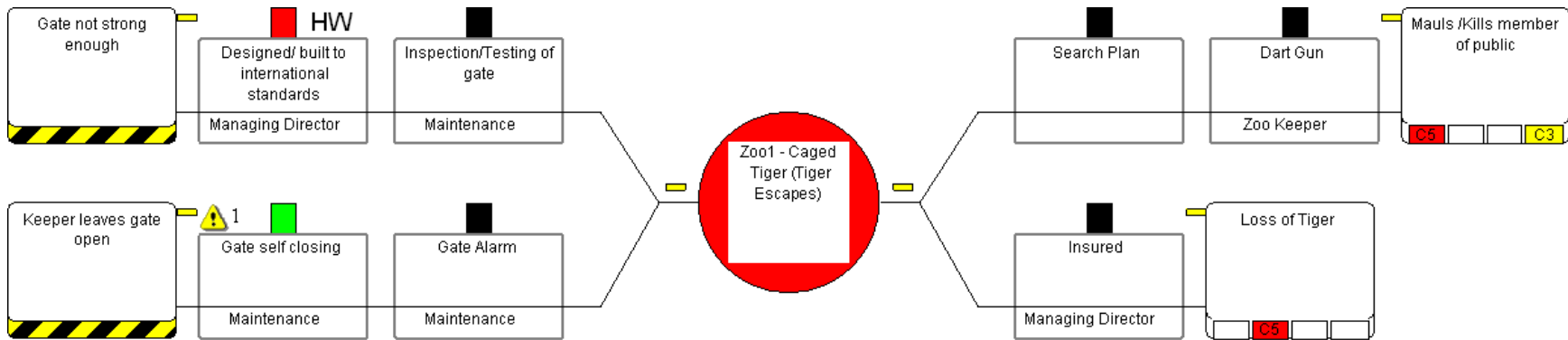
	A Never heard of in industry	B Heard of in industry	C Incident has occurred in our company	D Happens several times per year in company	E Happens several times per year in location
0 No Impact					
1 Slight Impact					Yellow
2 Limited Impact				Yellow	Yellow
3 Considerable Impact			Yellow	Yellow	Red
4 Major Impact		Yellow	Yellow	Red	Red
5 International Impact	Yellow	Yellow	Red	Red	Red

- Risk matrices are surprisingly uniform throughout the world, when following Best Management Practices (BMP)



Creating a bow-tie diagram

- A bow-tie diagram shows how a “top event” will be prevented and mitigated.



How to apply this to Sustainable Remediation:

1. We can calculate a bow-tie diagram for all the top events associated with a particular remediation alternative
2. The risk management costs are calculated as the sum of the installation and maintenance costs of all prevention and mitigation barriers
3. This cost is added to the remediation alternative as a negative monetary value



Using Bow-Tie, we can now associate a monetary value with social and ecological impacts (defined as the cost for prevention and mitigation)

•Economic values

- Negative(CAPEX, O&M, NPV, etc.) ► Calculate \$
- + Positive (e.g., return on investment) ► Calculate \$

•Environmental values

- Negative
 - Water & energy costs ► Calculate \$
 - Ecological impacts ► Bow-Tie ► Calculate \$
- + Positive
 - Carbon credits ► Calculate \$
 - Return from materials re-use ► Calculate \$

•Social values

- Negative (social impacts, H&S risks) ► Bow-Tie ► Calculate \$
- + Positive (local benefits, benefits to society) ► Calculate \$

Advantages of proposed methodology

- Methodology avoids subjectivity, or having to make political choices
- Risks assessments and the associated costs of implementing and maintaining the risk barriers can be based on BMPs that are widely accepted
- Besides social impacts, it's possible to incorporate ecological risks, H&S risks, etc.
- We do not have to make questionable choices between risks, in other words, we never have to compare risks directly (e.g., a “cancer slope factor” versus “the risk of having a diver accident”)

Thank you!

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