

A targeted application through the SEA  
route for an industrial use of  $\text{As}_2\text{O}_3$

Use at Boliden Kokkola Oy, Finland

**30.04.2014 | ECHA Workshop “Workshop on sharing experience  
on applications for authorisation”**

# Agenda

1. REACHLaw and our authorisation experiences
2. Project in general
3. Site specific exposure assessment (*ES*)
4. Analysis of alternatives (*AoA*)
5. Socio-economic analysis (*SEA*)
6. Lessons learned

# REACHLaw in a nutshell

*What we do? We provide global regulatory compliance and environmental sustainability services to ensure market access and operational sustainability for global businesses*

## KEY FACTS ABOUT US

- ✓ Established in Helsinki
- ✓ Offices in Brussels, New Delhi and Istanbul
- ✓ 30+ toxicologists, chemists, lawyers, socio-econ. analysts, business and environmental specialists
- ✓ 20+ local partners in Europe, Asia, Latin-America and the USA
- ✓ 350+ REACH registrations by 2010 deadline, 5% /all OR
- ✓ Language support in 10+ different languages
- ✓ more info about Us:  
[www.reachlaw.fi](http://www.reachlaw.fi)

## SERVICE AREAS

- ✓ Global chemicals regulatory compliance, e.g.

REACH	CLP
Biocides	China REACH
TCCA-Korea	TSCA-USA

- ✓ We prepare the required dossiers to authorities, SDSs, labels and provide related business strategy, legal and monitoring support.
- ✓ [www.compliantsuppliers.com](http://www.compliantsuppliers.com)

## OUR CLIENTS

- ✓ More than 200 customers from 40+ countries, from Fortune 100 companies to SMEs.
- ✓ Major industries served: Oil, chemicals, specialty chemicals, metals, space sector and other downstream users (DU) industries
- ✓ Our customers are manufacturers, importers, traders, DU's, industry associations and governmental organizations.

# REACHLaw's Authorisation Experience

Substance(s)	Activity	Status
$N_2H_4$	Exemption study & position paper	EC feedback pending
$As_2O_3$	DU authorisation application	Submitted
$As_2O_3$	DU authorisation application	Submitted
MOCA	Supplier authorisation application	On-going
$Na_2Cr_2O_7$	DU authorisation application	On-going
$CrO_3$ + other chromates	Space task force use survey, scoping study and management	On-going
$CrO_3$	Nordic hard chrome platers task force scoping study and management	On-going

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# Project In General

## Boliden Kokkola Oy - Continuous Improvement



### History:

- Production was launched in 1969
- Several expansions since then
- Continuous improvement

### Present:

- Second largest zinc plant in Europe
- 315 000 tonne production capacity
- Currently launching the Silver recovery

# Project In General

## Environmental Responsibility

### Top class environmental performance

- Specific emissions to the water system
  - Lower than in any other zinc plant
- Specific emissions in the air
  - Lower than average
- Energy efficiency
  - One of the world's most energy efficient zinc plants
- Recycling rate of municipal waste 94.7%



# Project In General

## Social Effects

- Significant employer
  - Largest private employer in the area
  - Substantial indirect impact on employment
  - Great source of employment for young people
- Important partner
- Notable taxpayer
- Supports local
  - Sports
  - Culture
  - Schools, institutes
  - Leisure time activities





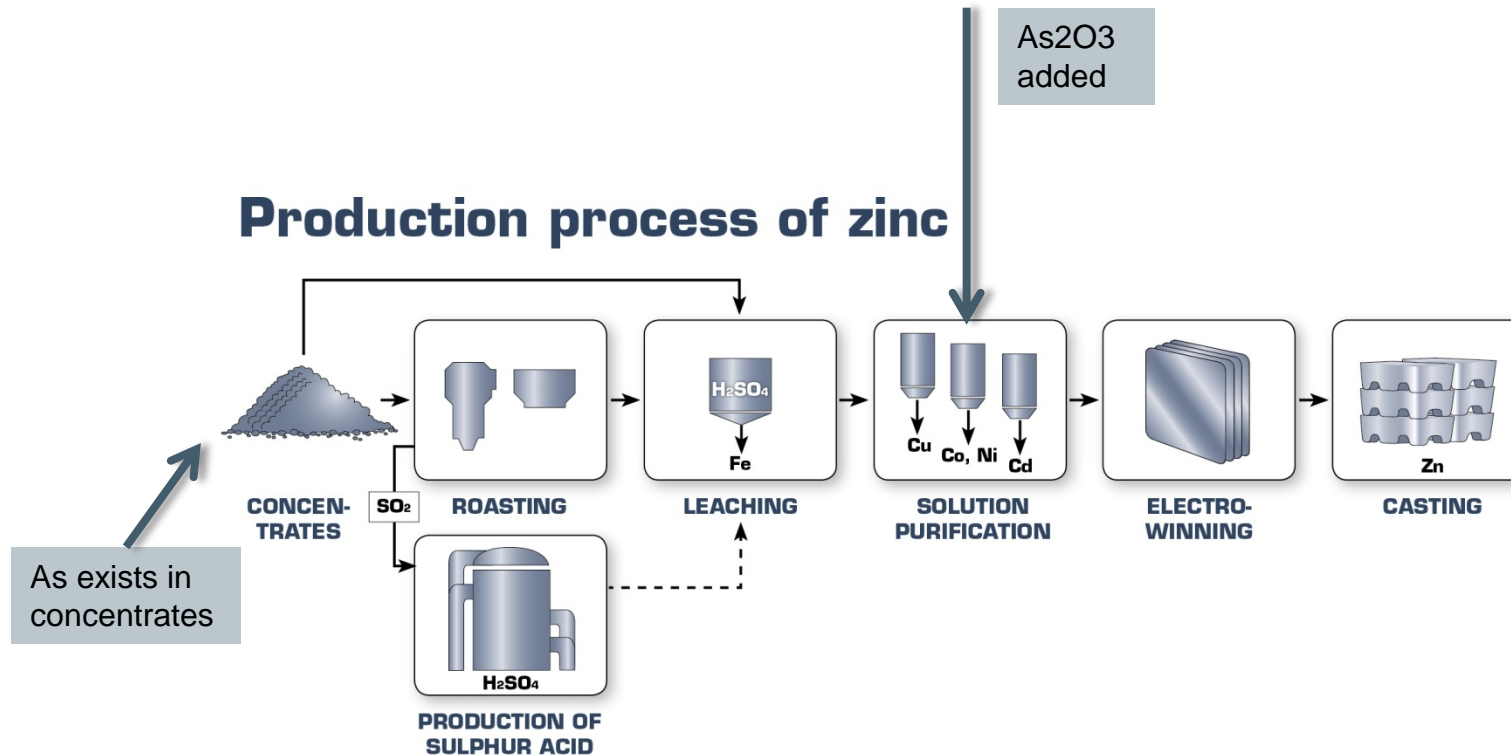
# Project In General

## Boliden Kokkola Oy Zinc Smelter: A Well Taken-Care of Plant



# Project In General

## Production Process of the zinc refinery



# Project In General

## Function of $\text{As}_2\text{O}_3$

- The function of  $\text{As}_2\text{O}_3$  is to eliminate “*impurities*” such as cobalt and/or nickel from the leaching solution of a zinc electrowinning process, without the co-precipitation of the cadmium and zinc.
- This function is essential to the success of the whole zinc production process, and cannot be made unnecessary.

# Project In General

## Authorization Requirements

- $\text{As}_2\text{O}_3$  is classified as Acute Tox. 2, Skin Corr. 1B, Carc. 1A, Aquatic Acute 1, Aquatic Chronic 1.
- Data not conclusive to derive a DNEL, even though there is evidence that the carcinogenicity is threshold in nature.
- Authorization through SEA route
  - Need to prove there is no SUITABLE alternatives;
  - Need to prove the socio-economic benefits outweigh the risks to human health and environment
  - CSR, AoA and SEA are needed.

# Project In General

## Building Up a Case

- The major challenge:
  - Antimony compound based alternatives are used by other zinc producers;
- Suitability
  - Technical feasibility; **Yes**
  - Availability; **Yes**
  - Risk reduction potential by the alternatives; **Yes**
  - Economic feasibility ?
- Conclusion: A detailed analysis and quantification of the risks and benefits are needed in order to build a convincing case.

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# Site Specific Exposure Assessment (ES)

## Methods Used on Site-Specific Risk Assessment

- Added risk approach is used in environmental assessment to focus on current release situations (to ignore historical contamination)
- Mass balance analysis was performed to separate the As in As<sub>2</sub>O<sub>3</sub> from the As in the ore concentrate.
- Preference in exposure estimation has been given to measured data over the modelled data
  - Personal sampling data
  - Static sampling data
  - Biomonitoring data
  - Modelling data (TRAM, MEASE)

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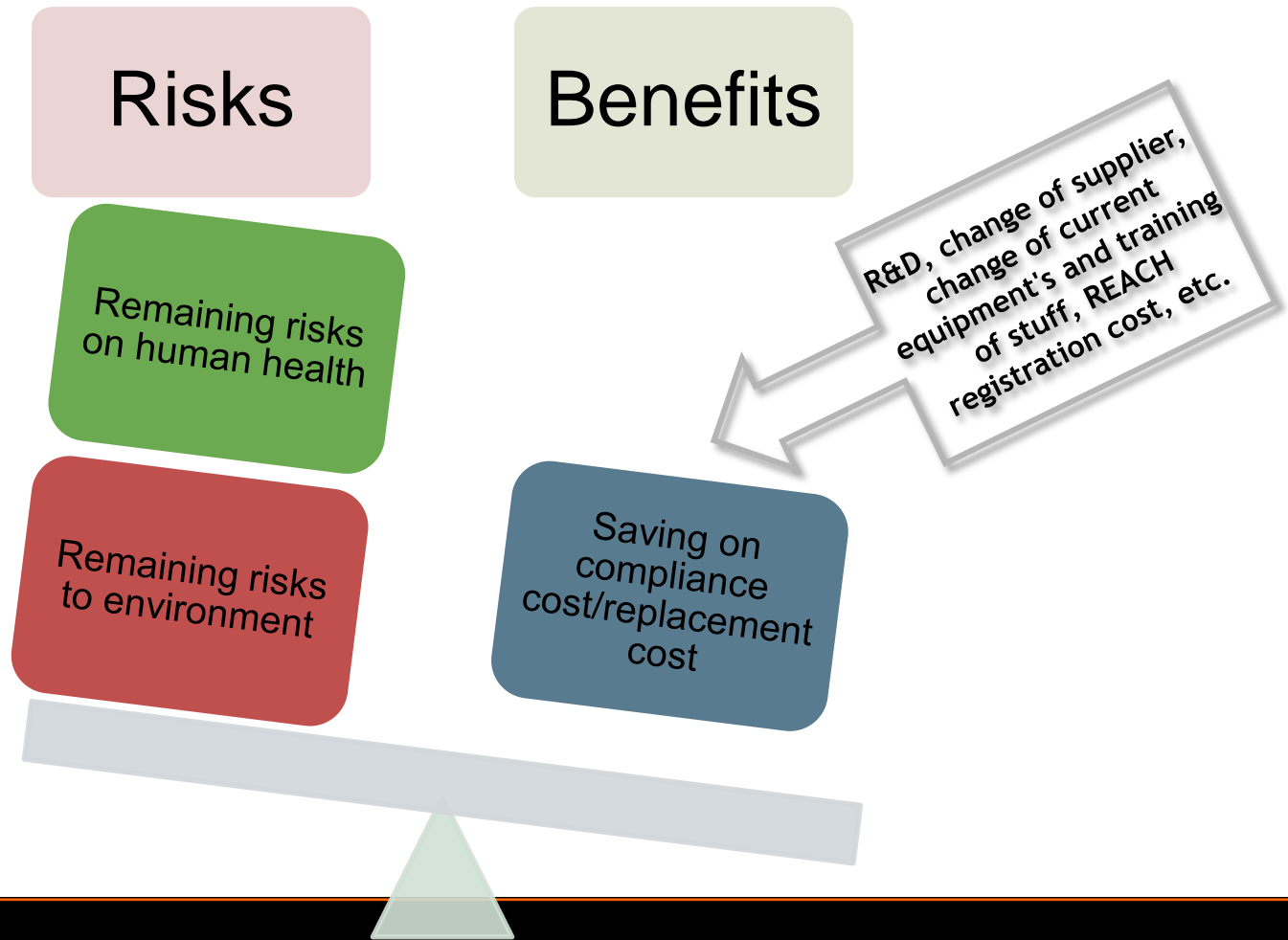
# Analysis of Alternatives (AoA)

## Alternatives Identification

- Literature search performed
- Third party consultation with Outotec
- Two antimony compounds were found as only industrial scale alternatives:
  - diantimony trioxide ( $\text{Sb}_2\text{O}_3$ )
  - antimony potassium tartrate ( $\text{K}_2\text{Sb}_2(\text{C}_4\text{H}_2\text{O}_6)_2$ )
- Economic feasibility need to be demonstrated
  - Guidance vs. SEAC paper in March 2013
  - How to draw the conclusion?

# Analysis of Alternatives (AoA)

## Economic Feasibility



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# Socio-Economic Analysis (SEA)

## Scoping

- **Temporal scope**
  - As stays in the environment, so impacts last longer than its use
  - 70 years
  - For socio-economic impacts time scope defined as the time plant would be functioning if nothing will be changed
  - 20 years
- **Geographic scope**
  - Local scope: Kokkola city
  - Area where the human health and environment impacts will mostly take place
  - A conservative definition of local business community

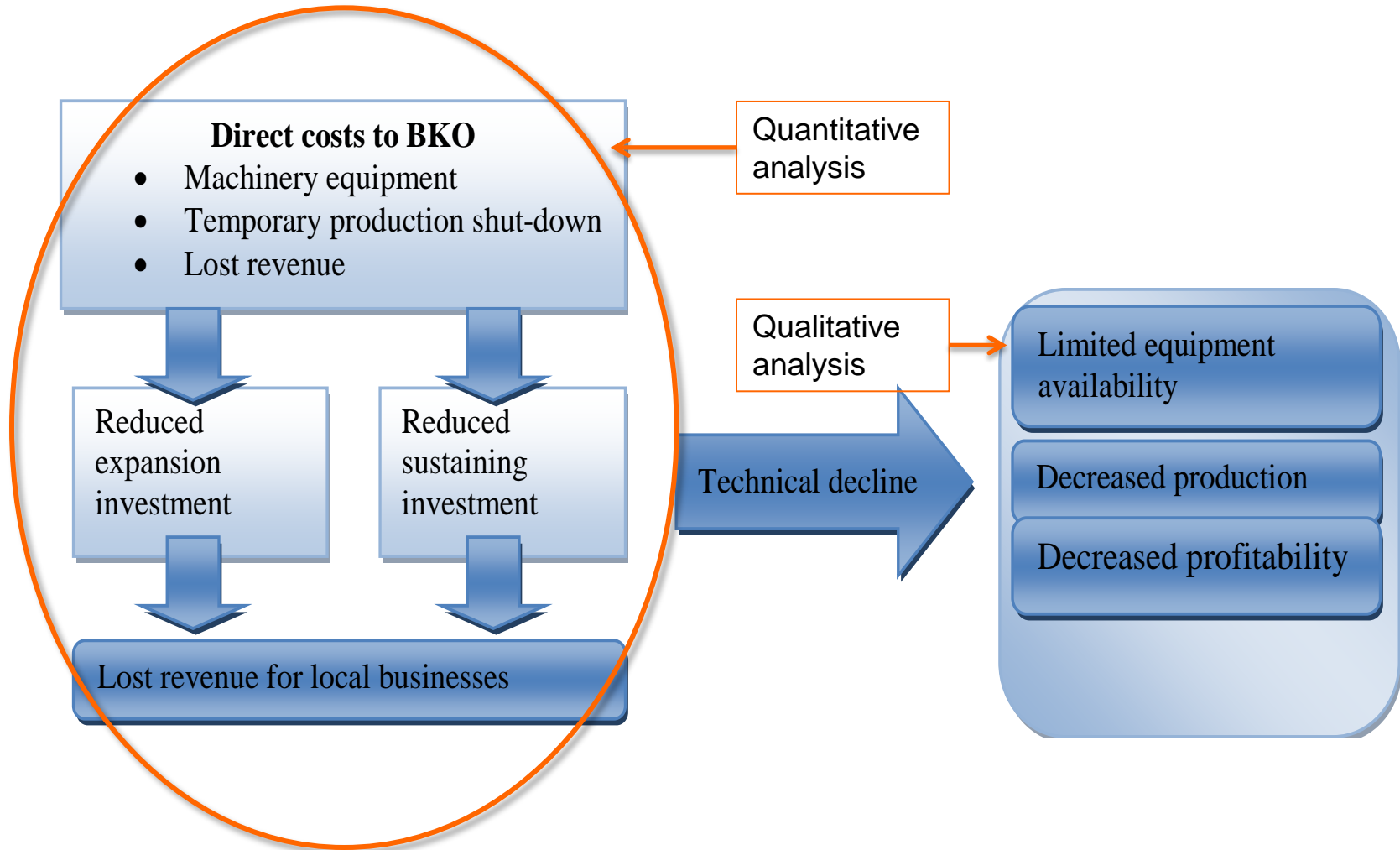
# Socio-Economic Analysis (SEA)

## Non-use Scenario

- Scenario:
  - Change to antimony compound based technology
  - Investment ceases
  - Factory enters spiral of decline

# Socio-Economic Analysis (SEA)

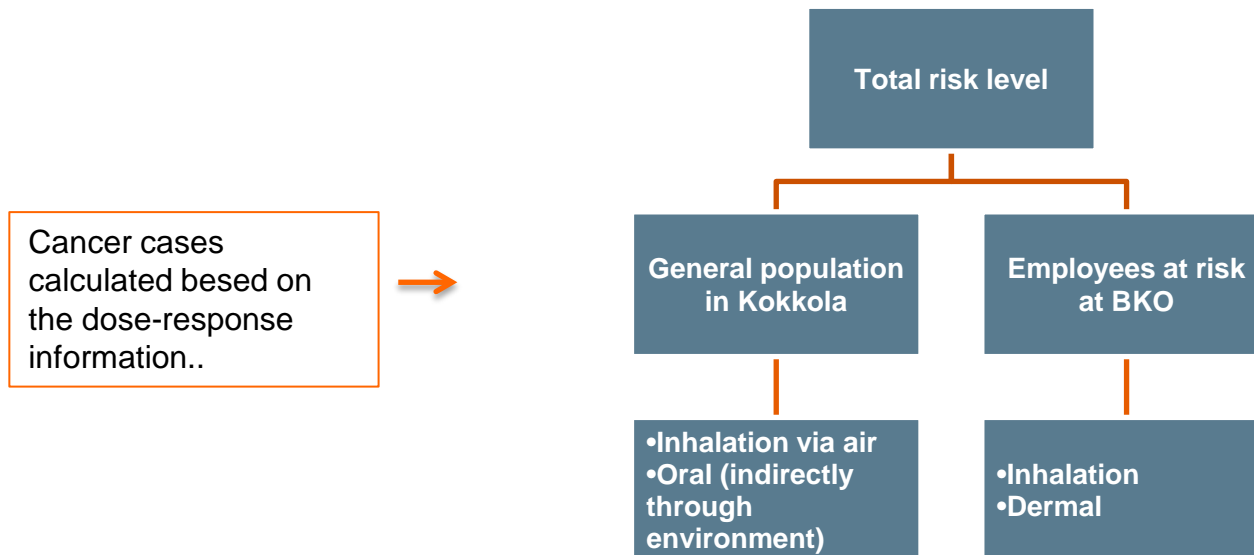
## Economic Impact of the Non-use Scenario



# Socio-Economic Analysis (SEA)

## Health and Environmental Impacts

- The current risk to environment is considered under control and therefore no impact is expected. Only cancer risks are estimated.



# Socio-Economic Analysis (SEA)

## Social Impacts

- Employment impacts;
  - Non-use scenario has no direct employment impacts;
  - But the spiral of decline will eventually cause significant unemployment, both directly and indirectly;
  - Qualitative analysis;
  - Uses background information to give a picture of how unemployment will likely to be long-term and therefore has negative social impacts.



# Socio-Economic Analysis (SEA)

## Wider Economic Impacts

- Boliden's competitiveness weakens
- European Zinc industry's competitiveness weakens
- Long-term competitiveness of the Kokkola city suffers due to long-term unemployment and loss of tax income

# Socio-Economic Analysis (SEA)

## Conclusion

Impacts or risks	Differences between the “applied for use” and the “non-use” scenario of changing to the antimony compound based technology	Net present value in 2013 for 20 year time period Presented as benefits (+) or costs (-) of non-use scenario in comparison with the continued applied for use
Risks or impacts on human health or the environment	Summary	+ €13,415,268 to €33,538,209
Economic impacts	Summary	- €148,501,507.57
Social impacts	Long-term unemployment	Loss
	Long-term unemployment for the local business	Loss
	Opportunity cost of foregone benefits to human health and the environment.	Loss
Wider economic impacts on innovation or trade	The increased costs will reduce BKO’s global competitiveness and further weaken the EU zinc industry’s position in the global zinc market. The reduced salary and tax will incur negative impacts on the economic development and long-term competitiveness of Kokkola.	Loss
Total		Between - €114,963,298.57 and - €135,086,239.57
Qualitative summary		All qualitative impacts are negative

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# Lessons Learned

## Lessons Learned

- AfA is not composed of three distinct parts, one needs to understand it as a whole.
- Confidentiality issues:
  - In AoA, separate the replacement program from the authorization project;
  - In SEA, remember the goal is to prove the benefits outweigh the costs in case of the continued use. If you can prove the case by publicly available information, stop there;
  - More information in public versions has its benefit;
- Do your homework well, because the committees will ask about all the details of how you did the work.

# Contact details

*“ REACHLaw, the best partner in Global Compliance ”*

David Chatfield, VP EHS&S, Dorf Ketal

REACHLaw  
Vänrikinkuja 3  
FI-02600 Espoo  
Finland

[www.reachlaw.fi](http://www.reachlaw.fi)

Ying Zhu, Ph.D, M.Sc (Econ.)  
COO, Partner

[ying.zhu@reachlaw.fi](mailto:ying.zhu@reachlaw.fi)