

# SUPRIM

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Supported by:



**Johannes Drielsma**  
**Euromines**

## What did SUPRIM achieve?



This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under the Horizon 2020, the EU Framework Programme for Research and Innovation

# Structure of this Talk

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- The need for SUPRIM from an industry perspective
- Some of the conceptual problems that SUPRIM had to solve
- Three key things that SUPRIM achieved from industry perspective



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# The mining industry

## is committed to Life Cycle Thinking

- to facilitating and encouraging the promotion of safe use, recycling and disposal of products through an understanding of their life cycles [[www.euromines.org](http://www.euromines.org)]
- to providing regulators and other stakeholders with scientifically sound data and analysis regarding its products and operations as a basis for regulatory decisions [[www.icmm.com](http://www.icmm.com)]



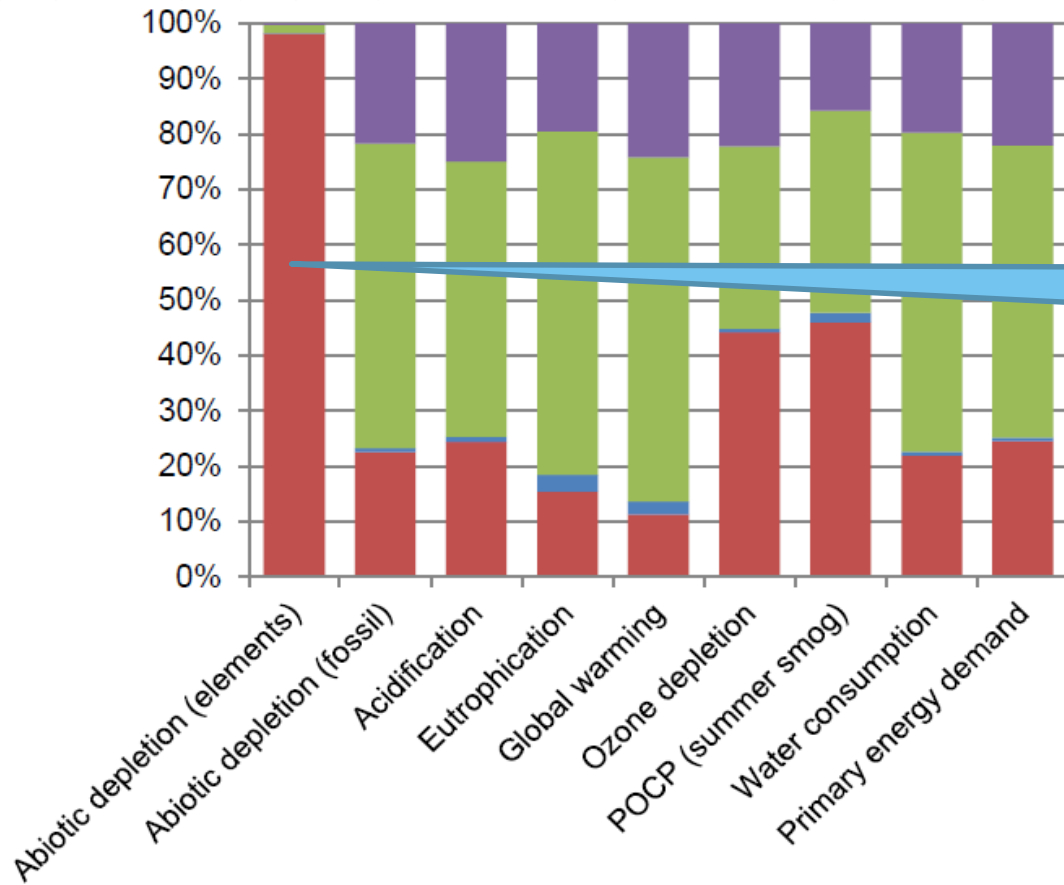
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# Risk of diversion from more serious environmental concerns



What does this mean?

Division of environmental impacts by life cycle stage across the UK's built environment

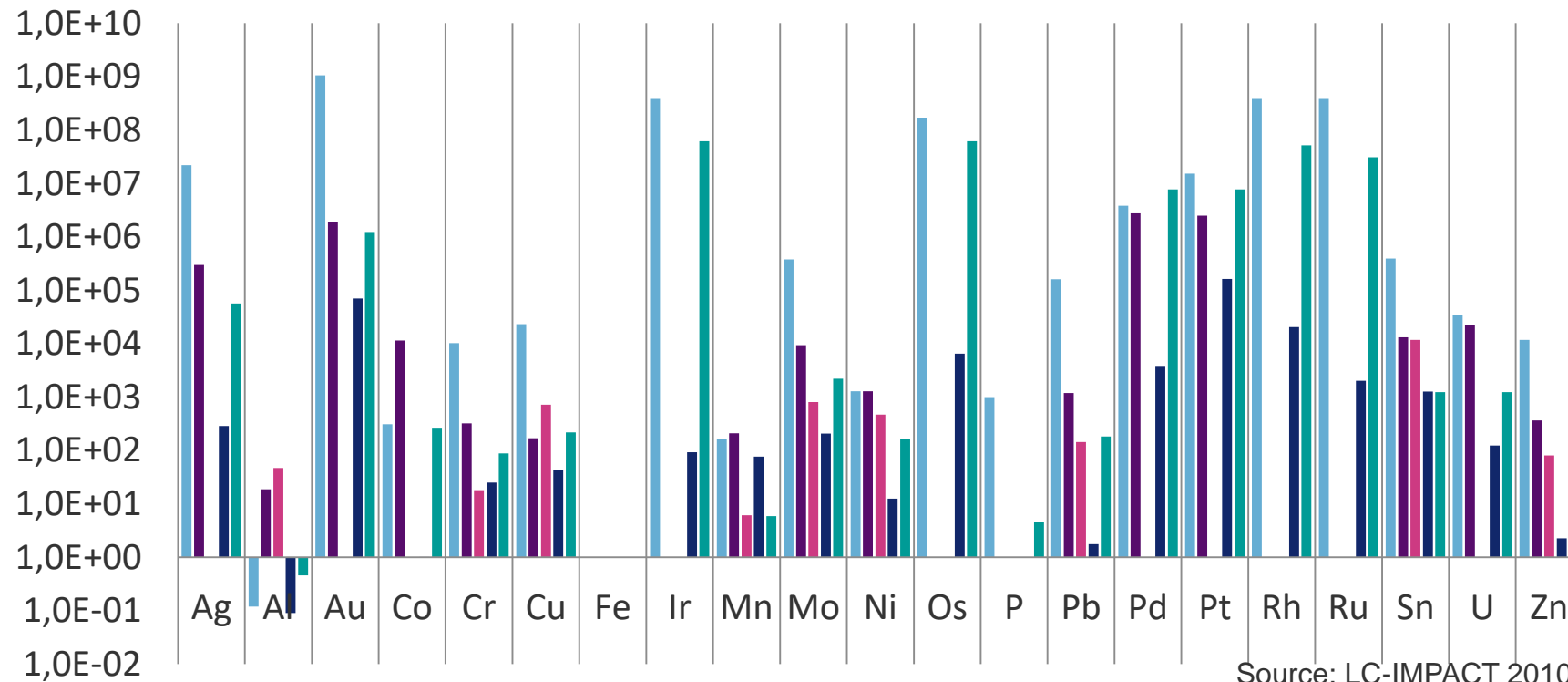
Source: PE International, 2012



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# Lack of consensus on the issue of concern



Different model concepts

Results span many orders of magnitude

Comparison of five Models for “Resource Depletion” 



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# A result of science-policy creep

- Shift from considering depletion in the environment to scarcity on the market
- Shift to asking: “Will our use of resources harm future generations?”
- Shift from “ultimate reserve” to “reserve base” or “economic reserve”
  - Shift to socio-economic considerations, more dependent on human behavior
  - Shift to parameters more difficult to predict
    - i.e., from long-term stable system to short-term volatile system
- LCA methods not considering scarcity were tending to be discarded
- E.g., EU ILCD Handbook & PEF Guidance originally went this way



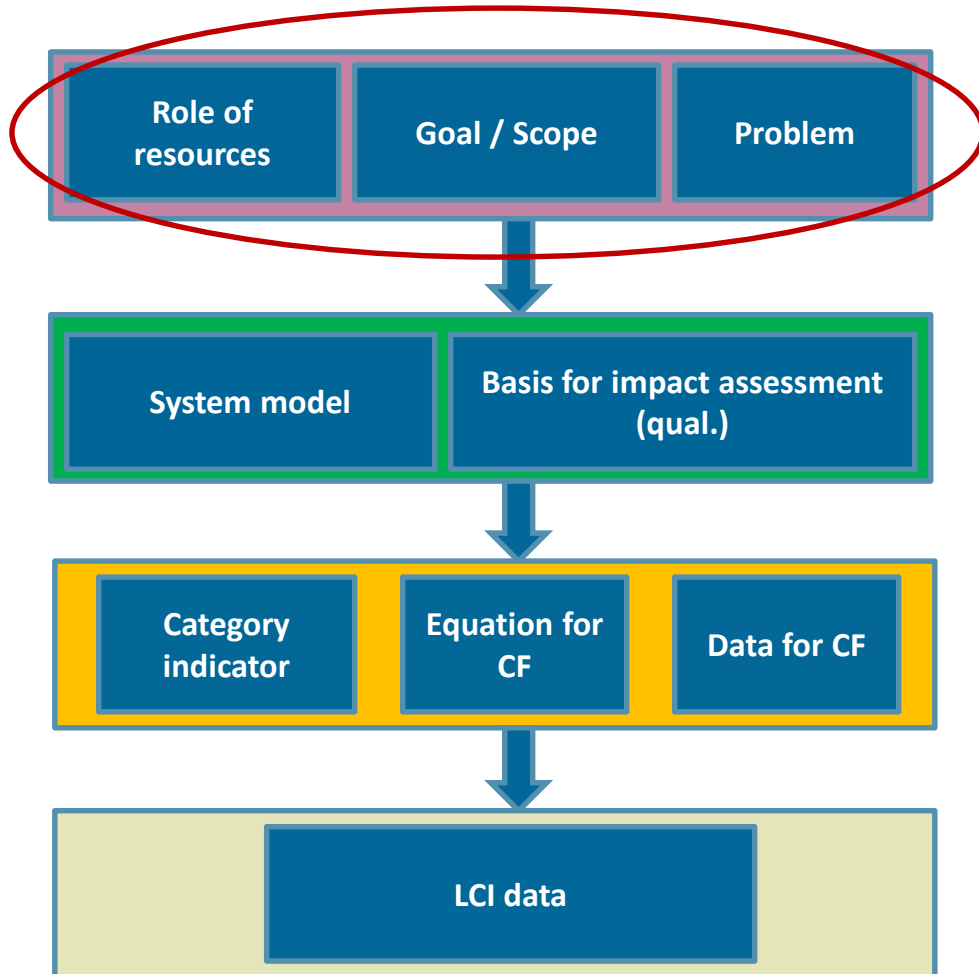
# What we saw

- **Confusion** – no common *Vision*
  - What is the potential threat or impact?
  - Competing / Entrenched Visions
- **Resistance** – unaligned *Incentives*
  - E.g., Use of science/tools before fully accepted/developed/proven
    - Commercial interests almost everywhere
    - Assuming, mis-understanding or dismissing others' incentives
    - Lots of Doing , very little Listening
- **Frustration** – isolated sets of *Knowledge*
  - Lack of freely available data almost everywhere
  - No common Vision or Incentive = No time for Collaboration
  - Others' expertise seemingly impenetrable
  - Amateur forays into others' area of specialist expertise





# SUPRIM helped differentiate problems

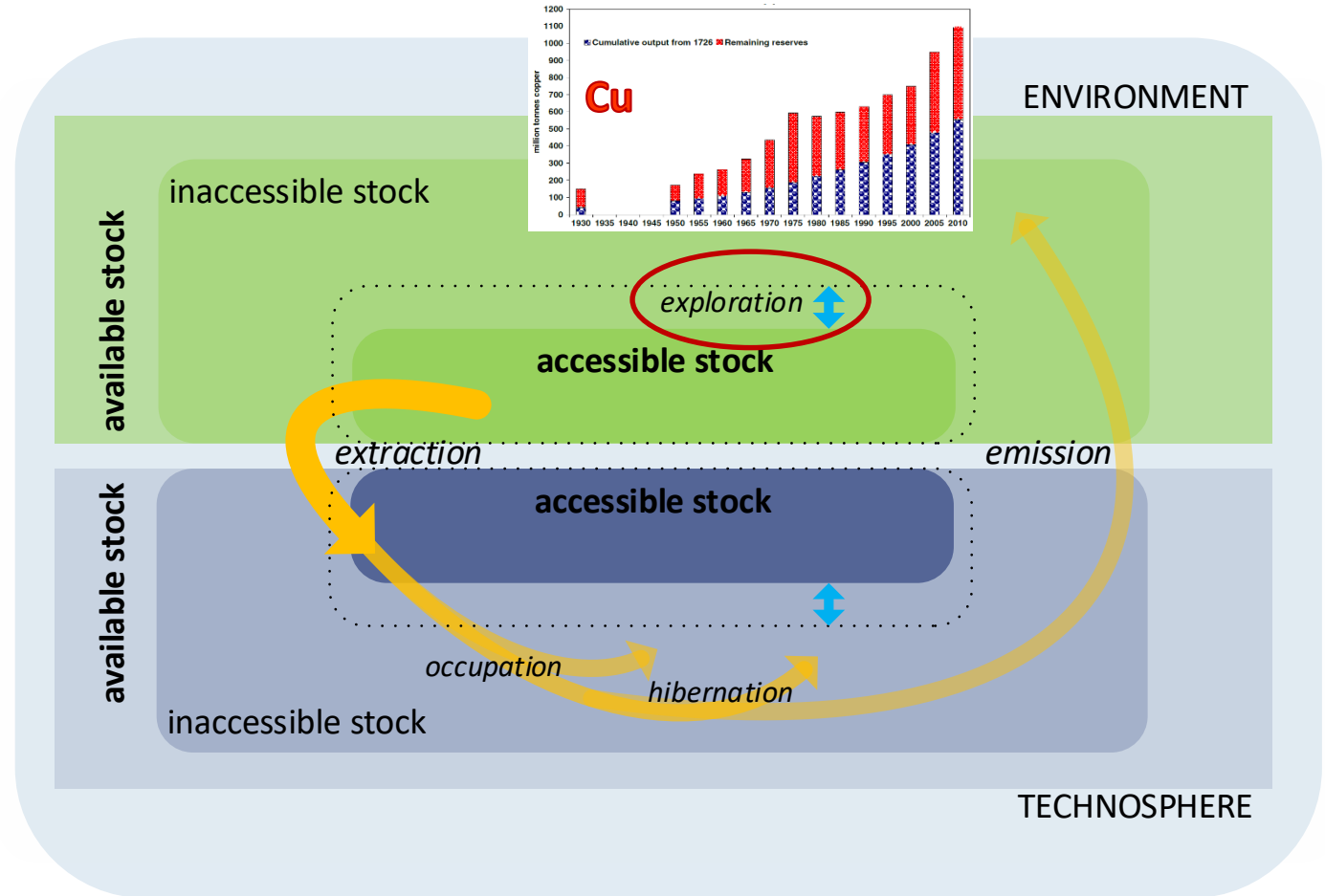
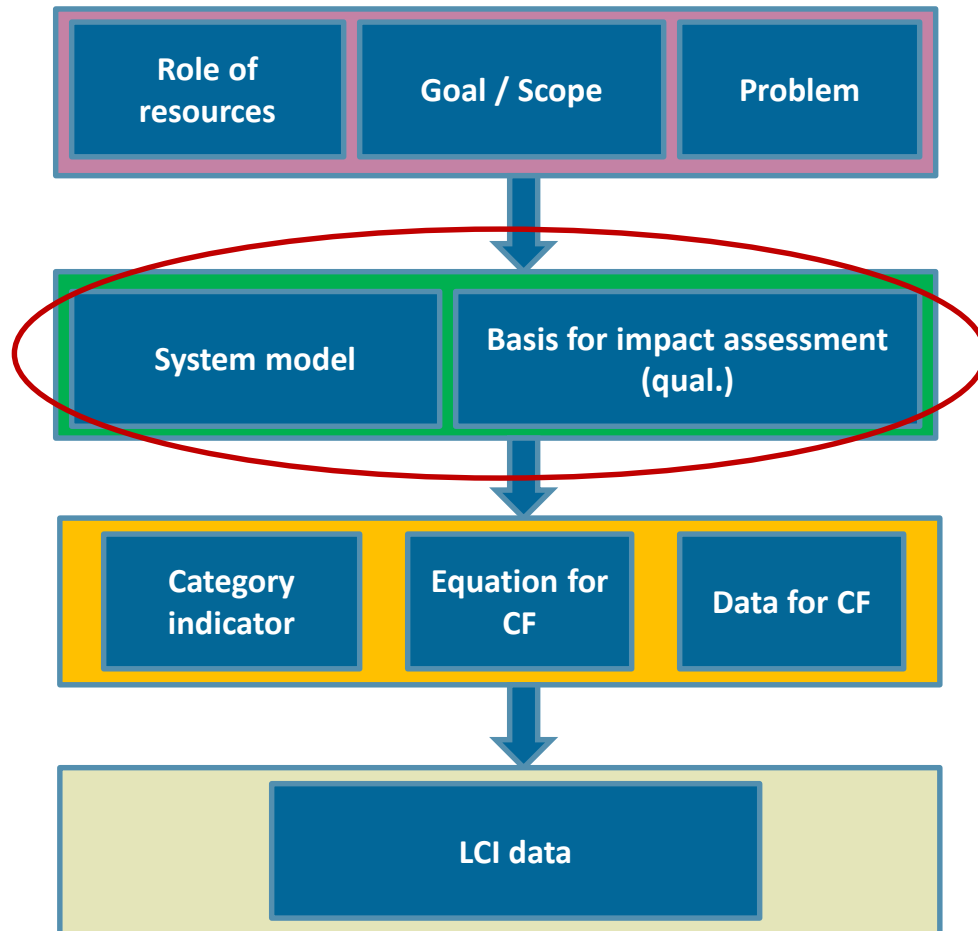


- A. abiotic resources are valued by **humans** for their functions used (by humans) **in the technosphere**, **primary production only**
- B. abiotic resources are valued by **humans** for their functions used (by humans) **in the technosphere**, **primary and secondary production**
- C. abiotic resources are valued by **humans** for their in-situ functions **in the environment**, **primary production only**
- D. abiotic resources are valued by **humans** for their functions in the technosphere and their in-situ functions **in the environment** considered useful to humans, **primary production only**
- E. abiotic **resources** are valued **in the environment** for their own sake, regardless of their usefulness in nature or technosphere, **primary production only**





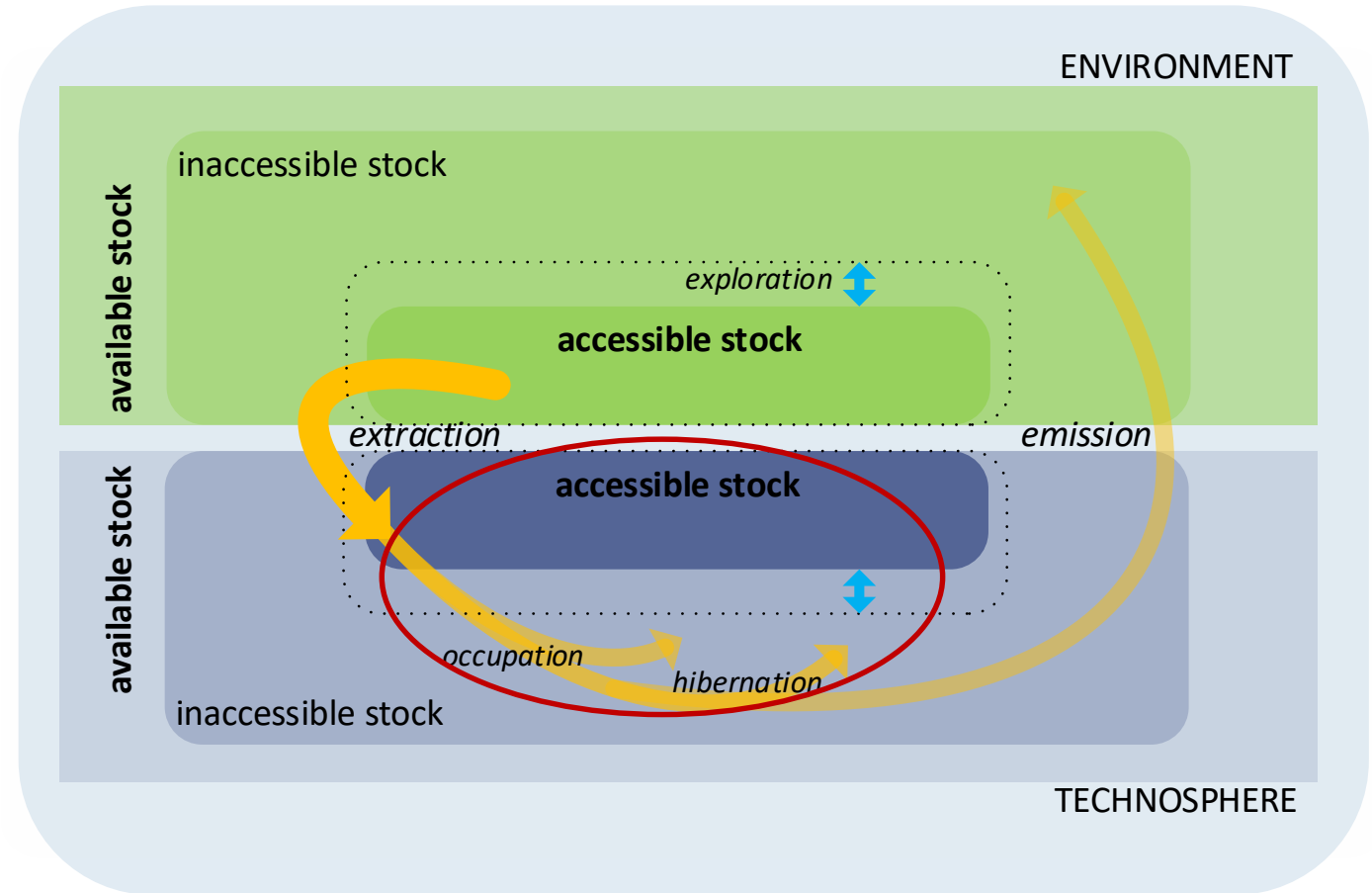
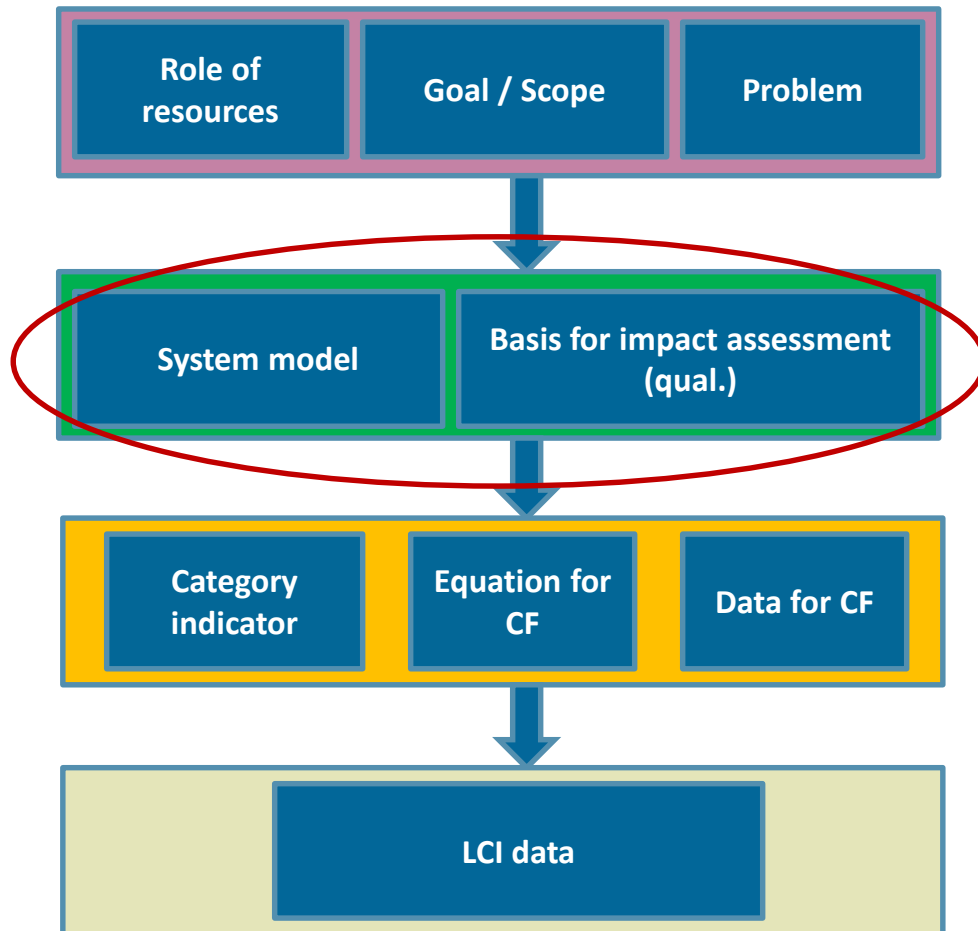
# SUPRIM accounted for Exploration



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# SUPRIM accounted for in-use stocks

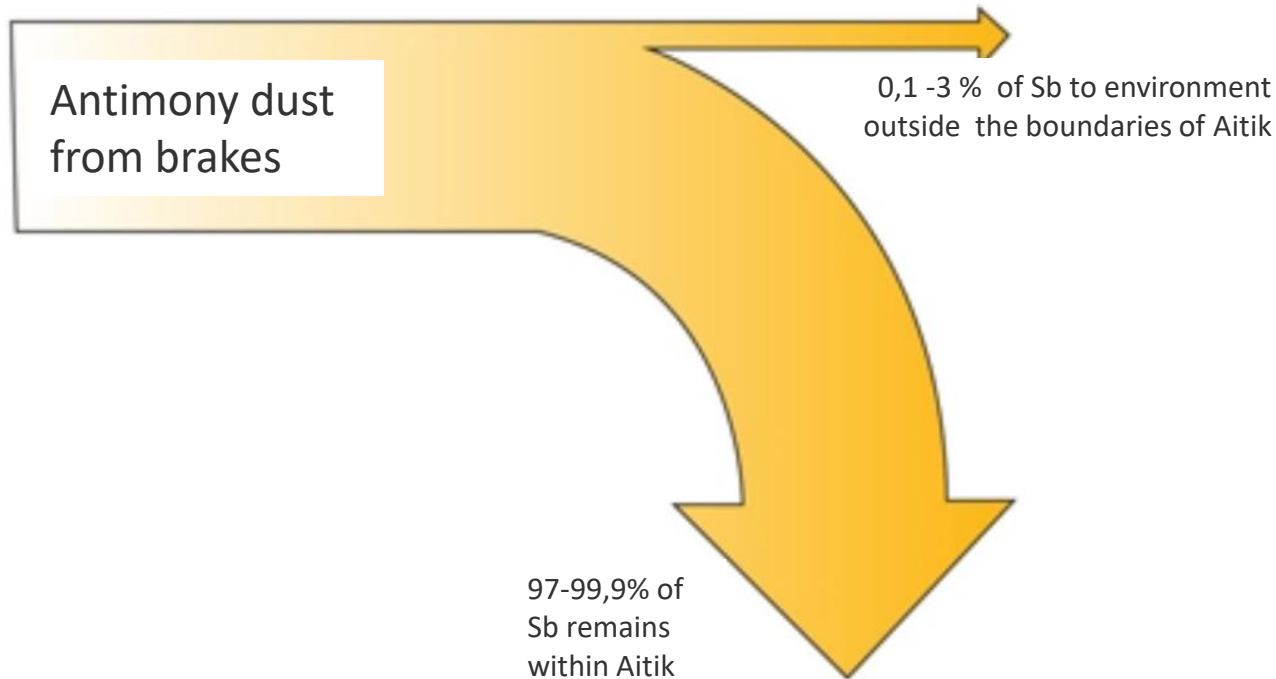


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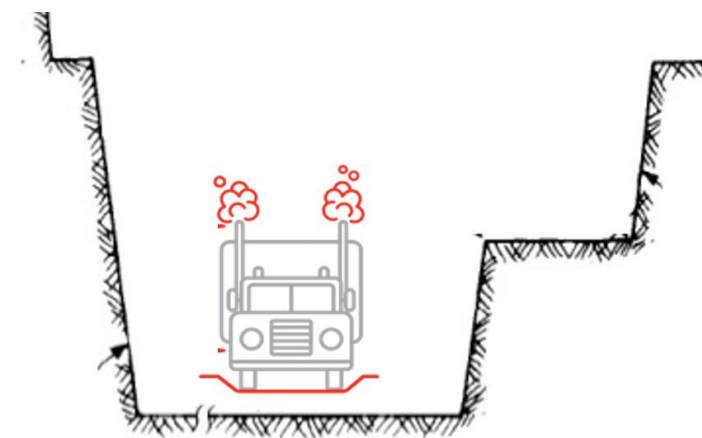
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# SUPRIM raised important issue

**All process models have to be ground-truthed with reality before we can trust the results**



Emissions go to the air but the major portion remains in the mine (technosphere)



*In reality, only 0,1% – 3 % will pass the boundaries of the mine*



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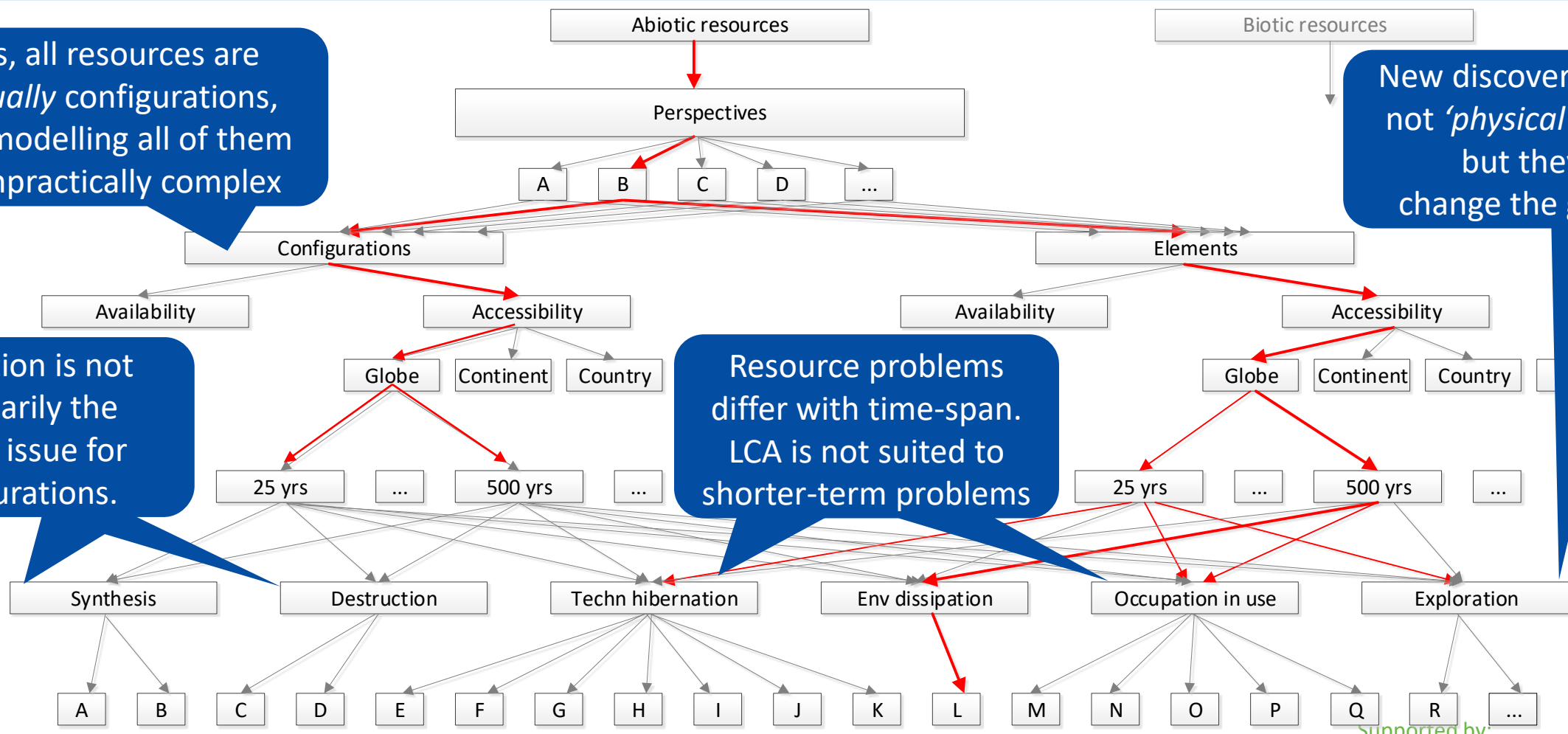
# SUPRIM put some other issues to rest,...

Yes, all resources are *actually* configurations, but modelling all of them is impractically complex

New discoveries are not *'physical flows'* but they change the game

Dissipation is not necessarily the biggest issue for configurations.

Resource problems differ with time-span. LCA is not suited to shorter-term problems



elaborated method with list of CFs



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# SUPRIM helps differentiate Tools

- Resource **depletion**: that the global amount of a specific resource could be exhausted
  - This is a **long-term** environmental concern
  - Elementary flows can be used → LCA/Environmental Foot-printing
- Resource **scarcity**: that supply of a specific resource could be insufficient to meet demand
  - This is a **short-term** societal concern
  - Economic flows & mass-balances are needed → Substance/Material Flow Accounting



# What SUPRIM Achieved

- Found a common *Vision*
  - What is the potential threat or impact? – apply the SUPRIM Framework
  - Reconciled Competing / Entrenched Visions – by dialogue, taking time, co-working
- Accessed aligned *Incentives*
  - Targeted use of science/tools that can be accepted/developed/proven – common concern for EIT, Universities, industry
    - SUPRIM partners aligned behind common commercial incentive – EIT funding
    - Could not assume, mis-understand or dismiss each others' incentives – dialogue, taking time, co-working
    - Lots and lots of Listening, Lots and lots of Reflecting, Lots and lots of Rephrasing – *then* Doing together
- Brought isolated sets of *Knowledge* together
  - Lack of freely available data almost everywhere – some field experience gained at the two copper mines
  - Common Vision or Incentive - EIT Raw Materials funding carved out time for Collaboration
  - New Respect for others' seemingly impenetrable expertise – dialogue, taking time, co-working
  - SUPRIM reports are a record of joint application of specialist expertise for future developers



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RawMaterials  
Connecting matters



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