



# Stimulating Substitution within a Circular Economy perspective in the metals sector, a conceptual frame

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# Content

- Existing legislation, pressures and other options relevant to the substitution of metals
- Key metal properties
- A proposed frame for assessing / stimulate substitution in a sustainable way



# Existing legislation, pressures & other options relevant to the substitution of metal

# Existing Legislation, pressures and other options

## Existing legislation:

- CMD
- CAD
- EU existing restrictions

## Others:

- Voluntary initiatives
  - Pb-stabilisers in PVC
- Use advised against in REACH dossiers

## Pressures:

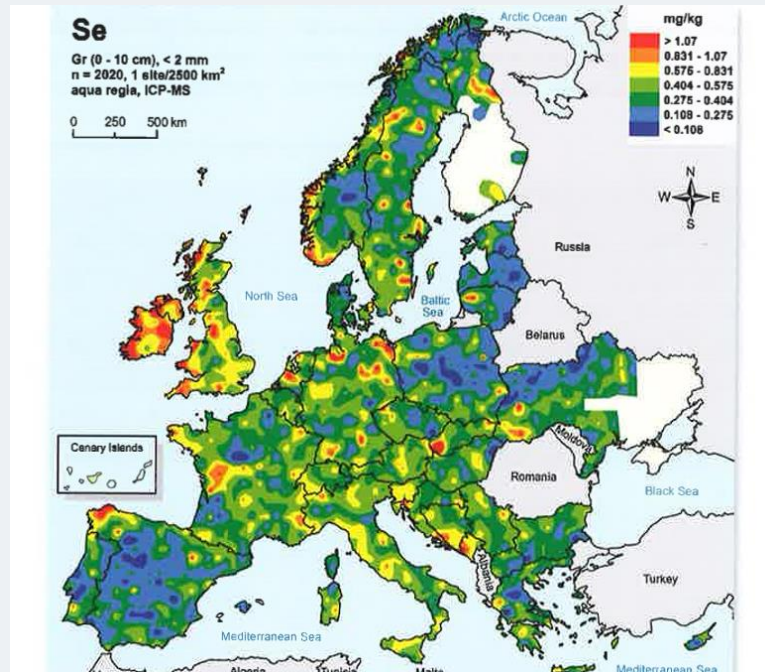
- Lower Technical performance:
  - NiCd batteries
- Material and Technology cost
  - Precious metal catalysts
- Availability of the substance
  - Replacers for Pb
- Tax measures
  - Tetra Ethyl-Lead as anti-knock agent in fuel



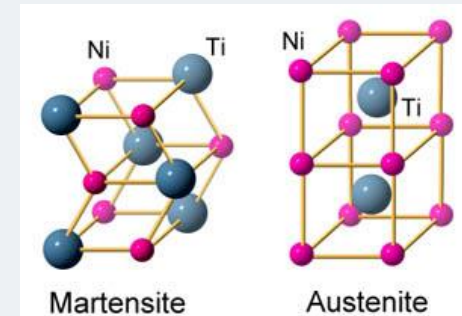
# Metal properties relevant to Substitution

# 1. Metals key properties

Metals are natural elements often occurring commonly (Zn-Cd, Pb-Ag, Cu-As, ...)



Recycling does not alter the original metal properties



PROMISE ME  
YOU'LL NEVER  
CHANGE!

PROMISE!

NO MATTER  
HOW MUCH  
THEY RECYCLE  
ME!

.. NON-FERROUS METAL ROMANCE ..

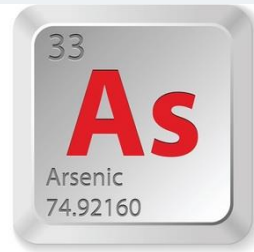
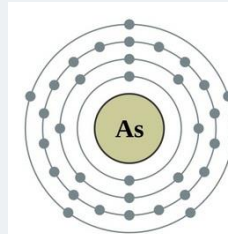


## 2 Safe use along the supply chain

- Effective and efficient chemicals management for metals is more about:

- “*preventing exposure than hazard*”

- Low exposure level workplaces
- Products that prevent releases and even limit hazard properties

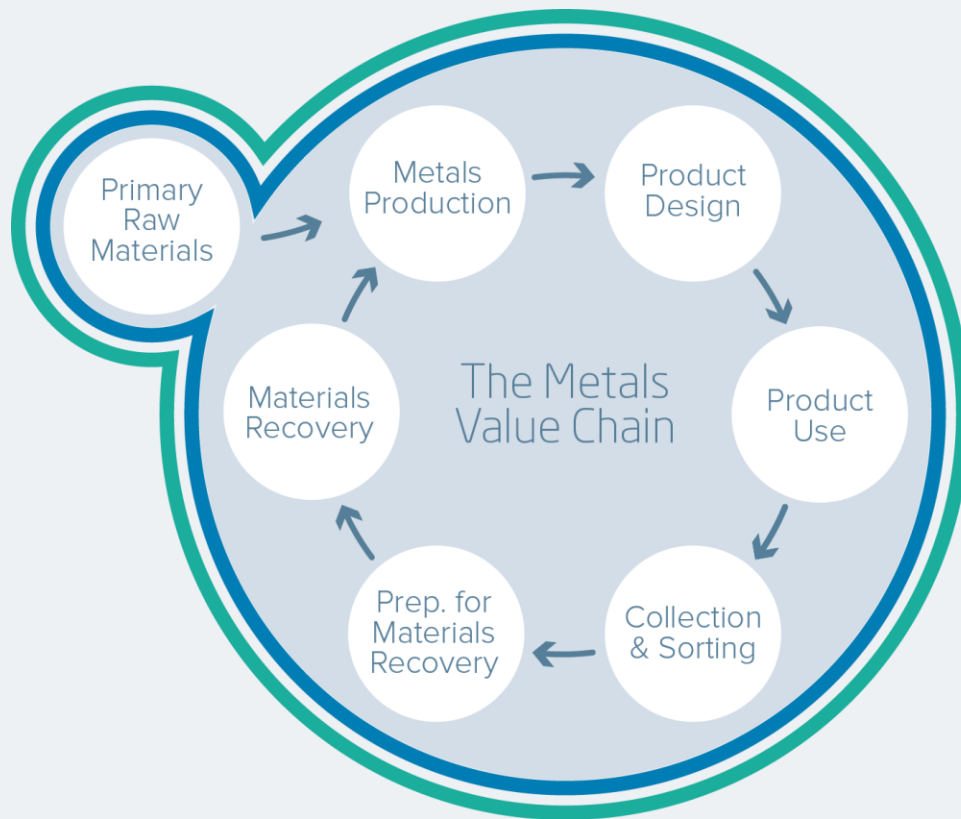


- Effective & safe recycling & reuse

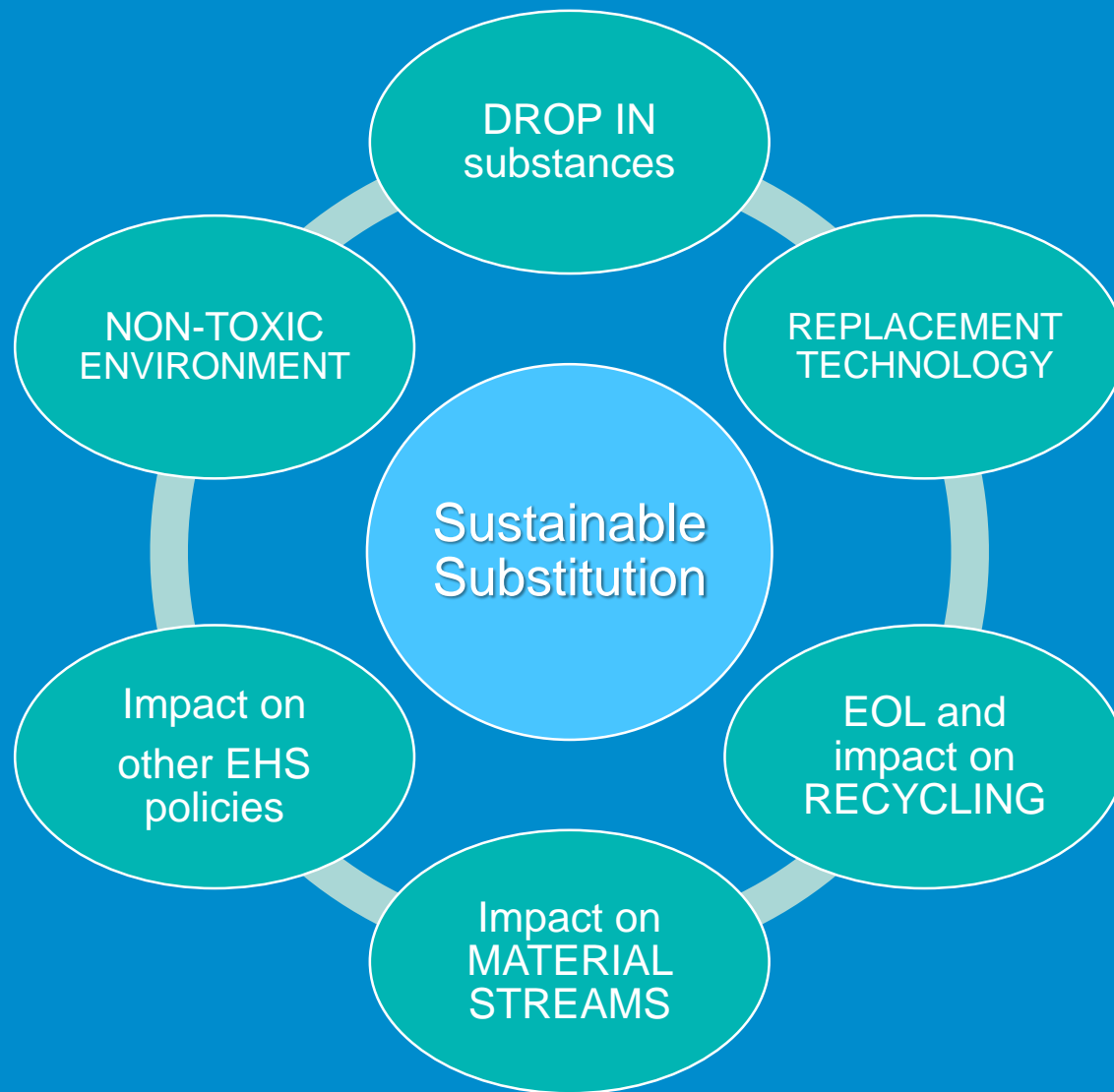


### 3. The substance/materials loop can effectively be closed for metals

- Closing the loop through safe *reuse or materials recycling* improves the performance of substances exponentially !







# A Conceptual Frame for assessing/stimulating substitution for metals

# Proposal for Frame for Sustainable Substitution assessment/promotion of metals

**Promote Sustainable substitution** by assessing in a **stepwise approach** if the replacement of a **Substance of Very High Concern** is **technically and economically feasible** from a **combined perspective** of Chemicals Management, Circular Economy, and other EU-Environmental and Health policy objectives; recognising **Societal Value and Impact**.



## Check for DROP-in or REPLACEMENT Technology

13 <b>Al</b> Aluminium	29 <b>Cu</b> Copper	28 <b>Ni</b> Nickel	82 <b>Pb</b> Lead	30 <b>Zn</b> Zinc	79 <b>Au</b> Gold	47 <b>Ag</b> Silver	78 <b>Pt</b> Platinum	51 <b>Sb</b> Antimony	4 <b>Be</b> Beryllium	14 <b>Si</b> Silicon	27 <b>Co</b> Cobalt	42 <b>Mo</b> Molybdenum	23 <b>V</b> Vanadium	50 <b>Sn</b> Tin	46 <b>Pd</b> Palladium	44 <b>Ru</b> Ruthenium	75 <b>Re</b> Rhenium	76 <b>Os</b> Osmium	77 <b>Ir</b> Iridium	74 <b>W</b> Tungsten	73 <b>Ta</b> Tantalum	32 <b>Ge</b> Germanium	34 <b>Se</b> Selenium	31 <b>Ga</b> Gallium	24 <b>Cr</b> Chromium	12 <b>Mg</b> Magnesium
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# Drop-In and Replacement Technology

Seems the easiest.... BUT:

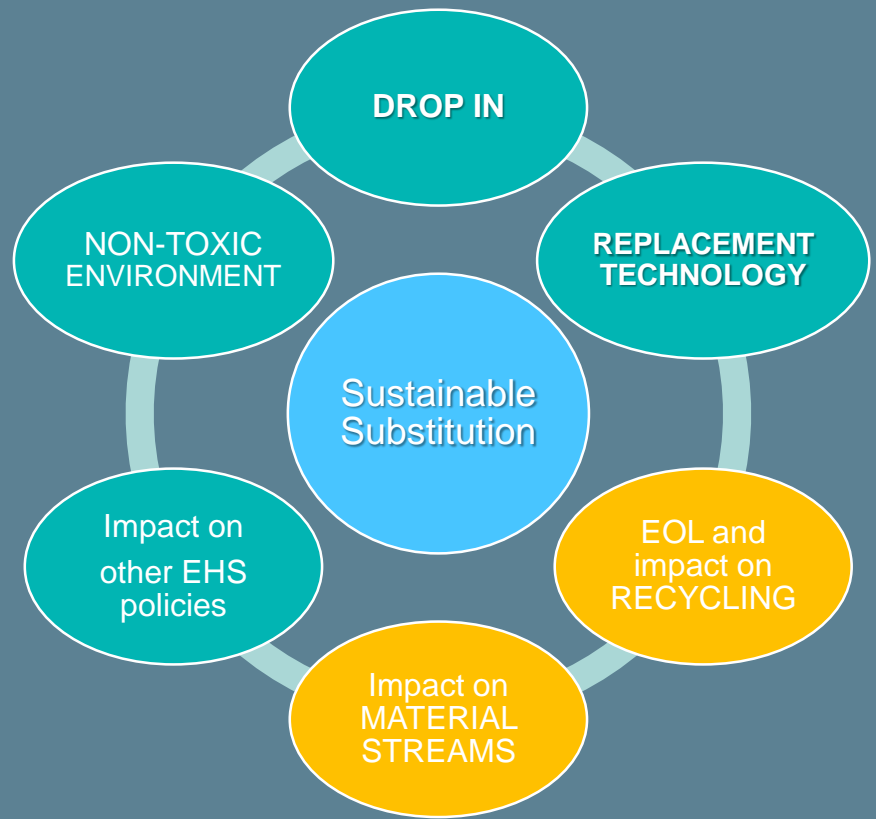
- Very often metals or compounds uses are linked to very precise and specific technical requirements
- Some metals or compounds are not replaceable despite the continuous pressure (social, regulatory and economic) to substitute

=> drop-in substitutes are hardly existing as such in the metals sector

If occurring ...then the driver for substitution was rather technology innovation and/or market pressure:

- E.g. different battery types, Pb replaced as anti-knock agent, different coatings for different technical specs (e.g. wearing resistance)...
- Although some historical uses in articles seem resistant to change (eg. Pb shot)...

First set of examples discuss cases and challenges on Drop-ins



## EOL, impact on Recycling and Material Streams

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# Impact on Recycling and Material streams

Societal and economic need for closing the loop !

Closing the loop is **MORE THAN RECYCLING** alone !

- **Recycling +**
- Providing the recycled materials a **SAFE USE** preferably by **separating all constituents** and using them again in a safe and equal way as primary materials

So **SUBSTITUTION** should **FAVOR** and not **PREVENT** recycling to:

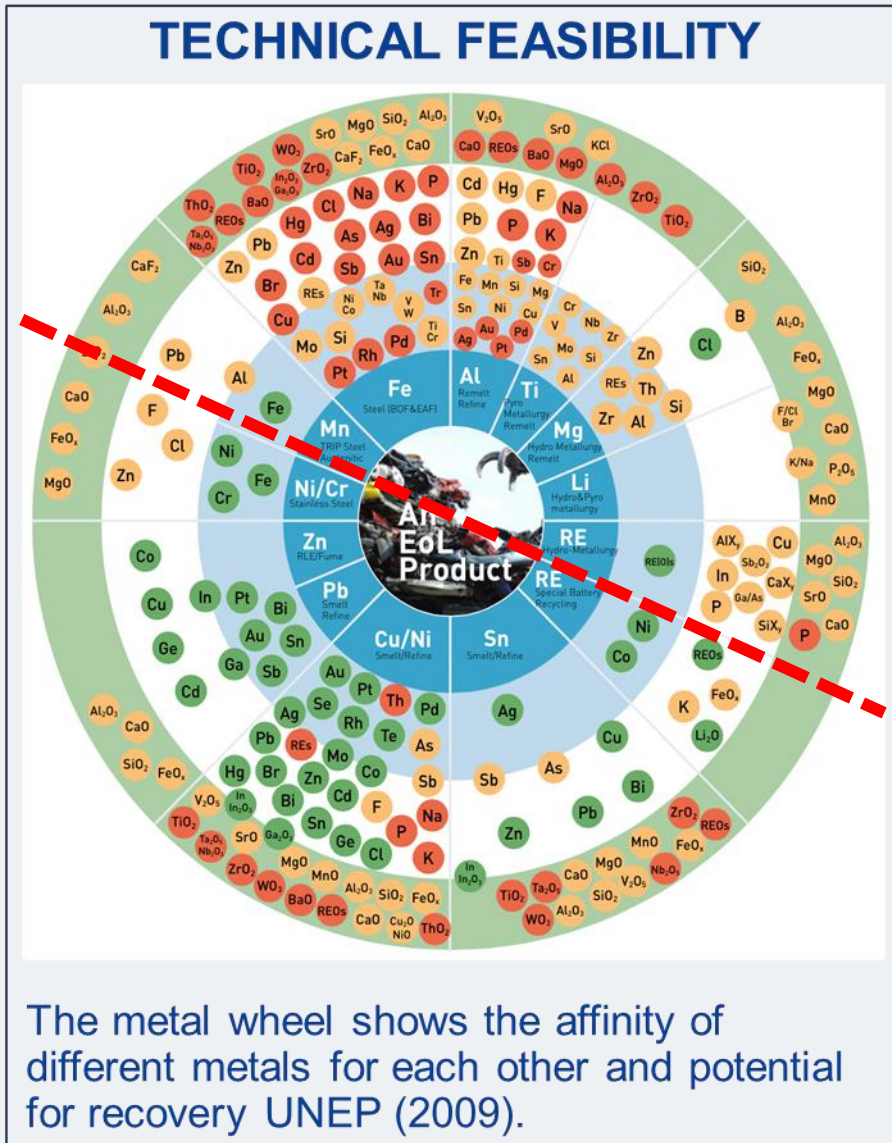
- Ensure a sustainable substitute and
- Prevent regrettable substitution from a Circular Economy perspective

Second set of examples discuss cases and challenges on Recycling





## Impact on Recycling and Material streams



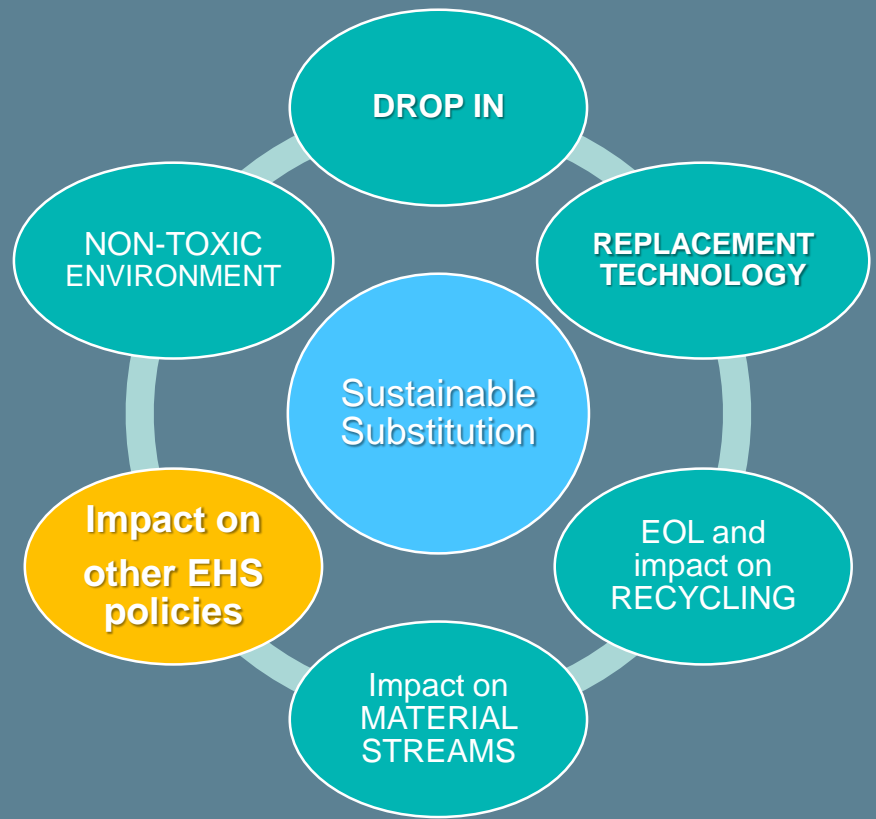
# RECYCLING of METALS

## Materials recycling by volume

(demonstrate safe use of  
impurity)

## Materials recycling by separation

(provide same safe use as primary material)



## Impact on other EU policies

# Impact on other EU Environmental and Health policies

## Important EU policies for metals:

- Chemicals policy

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- Circular Economy

- Clean air

- desulfurisation, autocatalysts, electrification of mobility, ...

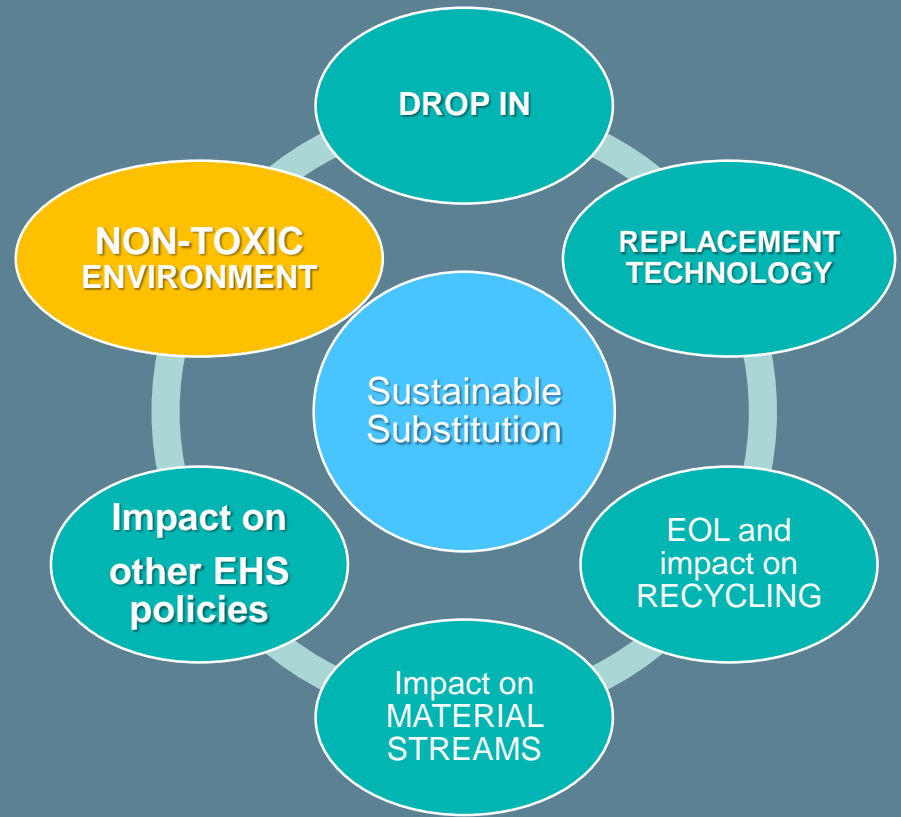
- Ensure Energy efficiency

- Reducing/minimizing footprint:

- Longevity of materials use (e.g. recyclable building products),
  - Materials intensity (recyclable light steel and Al) ...



SUBSTITUTION should include impact assessment of these to!



**A Non-Toxic Environment...**  
**or for metals & inorganics a *risk controlled Environment***

# A Non-Toxic Environment for metals...

## *Risk Controlled along all steps of the supply chain*

**NEW technologies** critical for economic development will use SVHCs:

- Solar and Windmill technology, Electric mobility, Autonomous driving, Digitalisation, Remote, ...

**SUBSTITUTION** should not hamper, rather help **promoting sustainable conditions** for these breakthrough technologies.

BUT HOW ?

**BY a RISK CONTROLLED application  
of the NON-TOXIC ENVIRONMENT concept**



Last example provides such a case of a new and sustainable technology: *mobile energy storage*.

# Demonstrate a risk-controlled environment

## What is Europe aiming to achieve?

Response to substitution push

### 1. Supply Chain

Address all concerns with chemical substances

Demonstrate state of the art knowledge and cooperation

Reduce "hazardousness"

Concern: Hazard-based or regrettable substitution

Recycling: safe management of impurities/minor constituents

Guarantee safe treatment of waste and end-of-life products

Concern: Rising impurity levels, e.g. in slags

Ensure proper supply-chain management

Concern: Guidance on 'safe use' is unrealistic or not followed up

Addressing Interface challenges

Better track chemicals in articles

Concern: Releases from non-safe article uses

Demonstrate knowledge on uses, materials



# Reach Metals Gateway – Provides concepts on metals

## Welcome to the REACH Metals Gateway!

This information system will guide the EU and International Metals Industry in the implementation process of the EU REACH and CLP Regulations. The REACH Metals Gateway allows quick and structured access to relevant information from authorities and from the metals industry. It is tailored to the specific needs of the metals industry sector. An overview is provided on responsibilities & contact points in metal commodity groups and national metal federations where more detailed information can be found.

	Ag	Al	As	Au	B&P
Cd	Co	Cu	Fe	Ge	In
		Mo	Ni	Pb	PGM
			Sb	Se	Sn
		Te	V	Zn	others

### Upcoming Events

#### A&R Platform

Date: 06/27/18 10:30 to 16:00

#### REACH Forum

Date: 06/28/18 10:30 to 16:00

# THANK YOU

More information, contact:  
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