



EEN-PACT

*Bringing together the **E**nterprise
Europe **N**etwork to improve
environmental management in
the leather, **PA**per, **C**hemicals
and **T**extiles sectors*

Specific training on surface treatment

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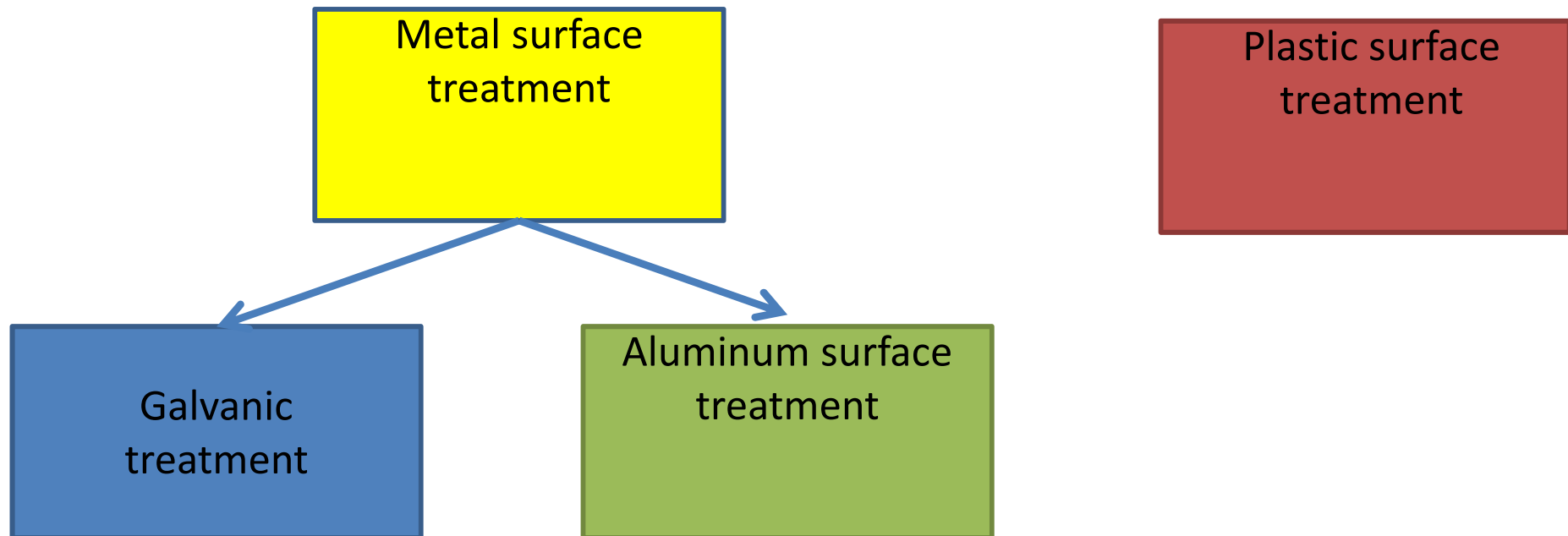
Unioncamere Veneto – Eurosportello del Veneto, 15th June 2012



AGENDA

- Background
- Environmental issues
- Environmental services
- Closing remarks
- Q&A

Surface treatment: metals and plastics are treated to change their surface properties for: decoration and reflectivity, improved hardness and wear resistance, corrosion prevention and as a base to improve adhesion of other treatments such as painting or photosensitive coatings for printing.



Surface finishing processes can be categorized by how they affect the workpiece:

Adding and altering

Blanching
Case hardening
Ceramic glaze
Cladding
Electroplating
Galvanizing
Glazing
Knurling
Painting
Passivation/Conversion coating
Anodizing
Bluing
Chromate..

Removing and reshaping

Abrasive blasting
Sandblasting
Burnishing
Chemical-mechanical planarization (CMP)
Electropolishing
Flame polishing
Gas cluster ion beam
Grinding..

Mechanical finishing

Abrasive blasting
Sandblasting
Burnishing
Grinding
Mass finishing processes
Tumble finishing
Vibratory finishing
Polishing
Buffing..

Table 9.1: Manufacture of basic metals and fabricated metal products (NACE Subsection DJ)
Structural profile, EU-27, 2006 (1)

	Enterprises		Turnover		Value added		Persons employed	
	(% of thousand)	(% of total)	(EUR million)	(% of total)	(EUR million)	(% of total)	(% of thousand)	(% of total)
Basic metals & fabricated metal products	417.7	100.0	863 744	100.0	244 404	100.0	5 080.5	100.0
Basic metals	17.0	4.1	395 000	45.7	79 400	32.5	1 100.0	21.7
Iron, steel & ferro-alloys; tubes; other first processing of iron & steel	6.7	1.6	237 132	27.5	49 550	20.3	612.6	12.1
Precious & non-ferrous metals	3.6	0.9	120 298	13.9	17 845	7.3	221.5	4.4
Casting of metals	6.7	1.6	37 570	4.3	11 787	4.8	270.0	5.3
Fabricated metal products	400.0	95.8	469 000	54.3	165 000	67.5	4 000.0	78.7
Structural metal products	121.7	29.1	123 086	14.3	40 839	16.7	1 116.7	22.0
Tanks, reservoirs & containers; central heating radiators & boilers; steam generators	14.8	3.5	42 820	5.0	14 207	5.8	316.3	6.2
Forming of metal; powder metallurgy; treatment & coating of metals; general mechanical engineering	158.0	37.8	162 220	18.8	60 156	24.6	1 430.2	28.2
Cutlery, tools & hardware; other fabricated products	106.3	25.5	141 004	16.3	49 677	20.3	1 113.0	21.9

(1) Rounded estimates based on non-confidential data.

Source: Eurostat (SBS)



Galvanic Plant



Hot dip





MR Energy

Consulting & Systems



Cilindri da stampa rotativa, carta da parati con fusti in legno e grafismi in rilievo - primi '900



CETS

European Committee for Surface Treatment represents

22 members from 14 European countries

- Painting: 4 Associations
- Plating: 8 Associations
1 Institute
- Painting and Plating: 5 Associations 1 Institute
- Associated 3 Associations



CETS

Sectors

- **Painting Section:** suppliers of equipment and applicators of organic coatings
- **Plating Section:** suppliers for chemistry and equipment and applicators of chemical and electrochemical surface treatment



CETS

The branches are:

- Chemical and electrochemical treatment of metal and plastics
- Physical and thermal metal coating
- Plants and equipment for organic coatings
- Plants and equipment chemical and electrochemical treatment
- Plants and equipment for mechanical plating
- Plants and equipment for physical deposition
- Pollution abatement for water and air



CETS

The aims are:

- Exchange of knowledge on health, safety and environmental issues
- Exchange of information on matters of statutory regulations
- Exchange of information on business statistics
- Aspire an European standardisation
- Observe market development and sales statistics
- Accomplish market research

Italy: Assogalvanica



Alessandro Volta



Luigi Galvani



Luigi V. Brugnatelli

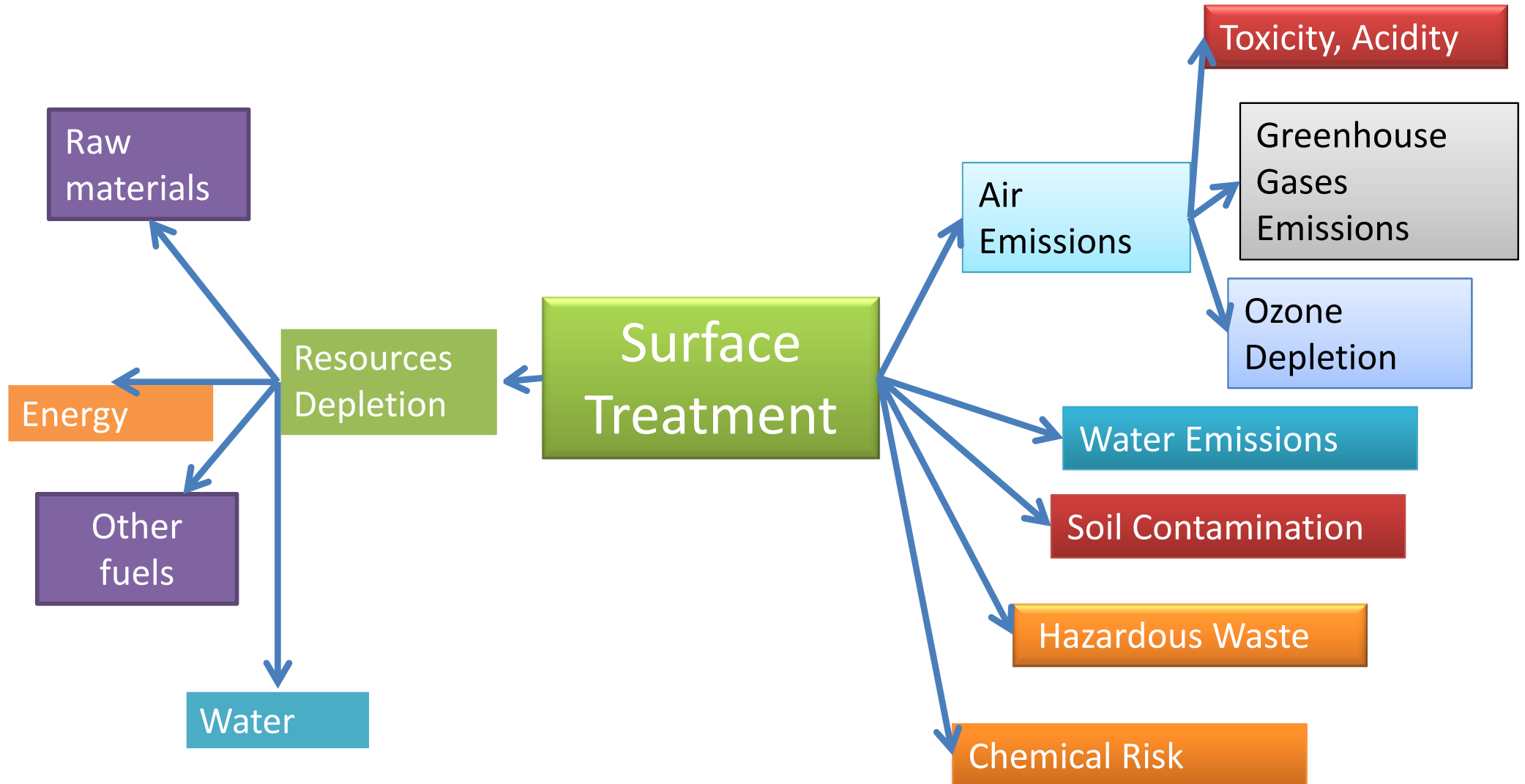




Ecometal is a nonprofit consortium promoted by Assogalvanica and founded in 1994 by some member companies, with the input from the Environmental Council of the Veneto Region.

From 1994 to 2001 Ecometal examines and proposes environmental projects to the consortium in the. Among others, with support from the Region of Veneto, European Life Program project "Sorpmet" for the treatment of cleaning water in the Brite-Euram III Program 1998-2001.

Upstream -Environmental Impact - Downstream



Upstream

Raw materials

- metals used as soluble salts or anodes

Electricity

- electrolytic and electrochemical reactions
- operate plant equipment
- work space lighting
- cooling

Water

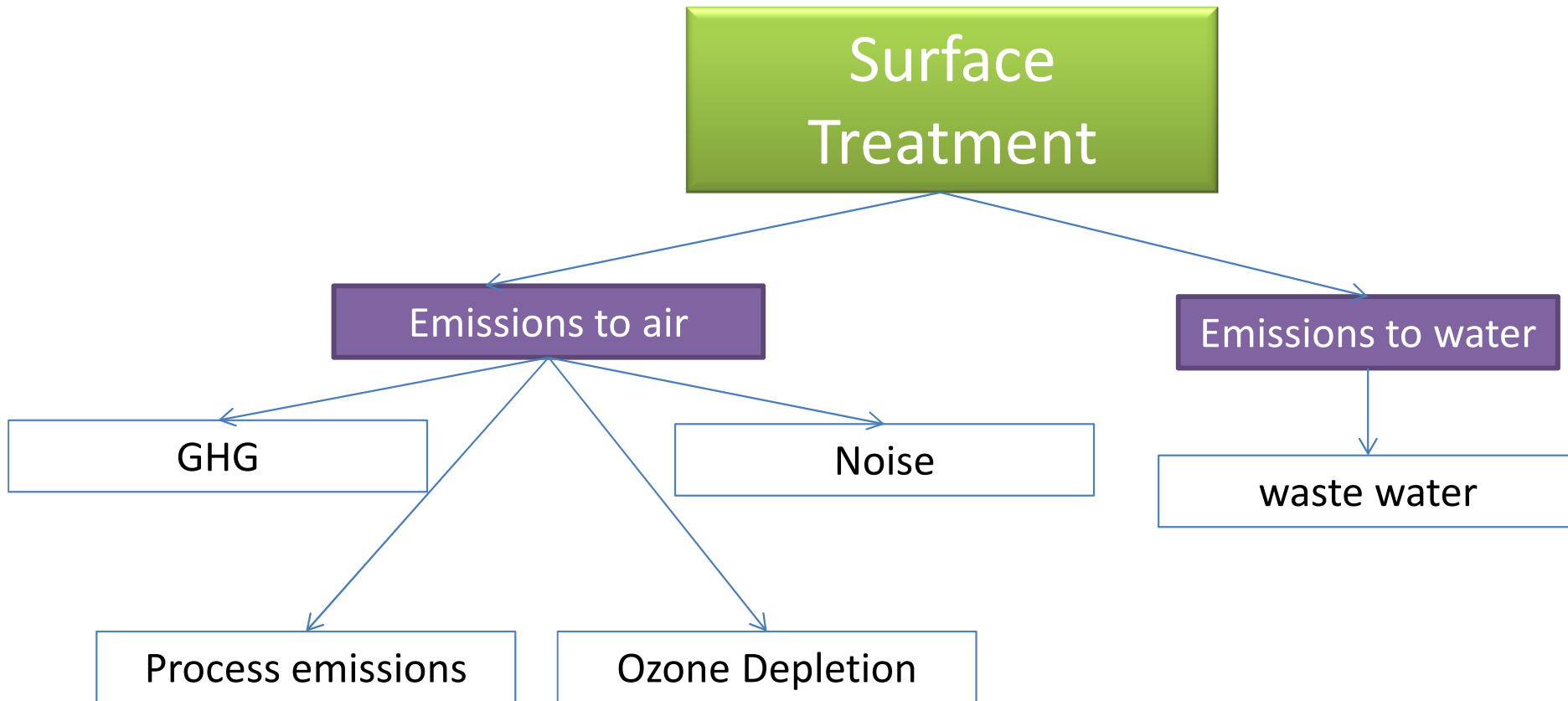
- base for several solutions
- cleaning

Other fuels

- heating processes and drying
- supplementary vat heating
- work space heating

Surface
Treatment
Industry

Downstream



Air Emissions

Toxicity, Acidity

- Surfactants
- NOX, HCl, HF
- acid particulates from pickling operations
- Hexavalent chromium
- Ammonia
- Dust

GHG Emissions

- Combustion
- Process Emissions

Ozone Depletion

- Direct and indirect

Water Emissions

Toxicity, Acidity

- Surfactants
- AOX
- Other ions (e.g. chlorides, sulphates, phosphates, nitrates and anions containing boron may be significant at a local level)

Global positive trend

- Nowadays industry is much more controlled and subject to strict EU and National regulation
- Moreover the diffusion of management systems and international standards has increased dramatically the level of attention of managers and employees at all levels, together with voluntary programs adopted by industries (EcoMetal)
- Consumers are much more caring about environmental impact of products they buy, including toxicity and waste management related aspects
- Diffusion of environmental standards on the demand side, such as LEED standard for buildings, where credits are recognized if materials with high recycled content are used.
- Carbon Footprint allows to take into account 'upstream' related emissions (extraction, primary cycles, transport)
- Social aspects of metal extraction are more and more taken into account

Directives and Regulations

EIA, SEA Directives

Environmental Impact Assessment (85/337/EEC)
Strategic Environmental Assessment (2001/42/EC)

Regulation REACH

The Regulation (EC) n. 1907/2006 concerning the Registration, Evaluation, Authorisation and restriction of chemicals and the establishment of the European chemicals

Regulation CLP

The Regulation (EC) n. 1272/2008 on classification, labeling and packaging of substances and mixtures

Directive EU-ETS

The Directive 2003/87/EC establishing a system of trading emissions of greenhouse gases in the European Union

Directive 2008/99/EC

This Directive establishes measures relating to criminal law in order to protect the environment more effectively.

Directive 2010/75/UE

Industrial Emissions Directive: IPPC, Waste Incineration, VOC, etc.

Standards and Voluntary programs

ISO 9001

Quality Management System

ISO 14001

Environmental Management System

OHSAS 18001

Organization's occupational health and safety management system

Eco-metal

Environmental programme of the Italian Galvanization association

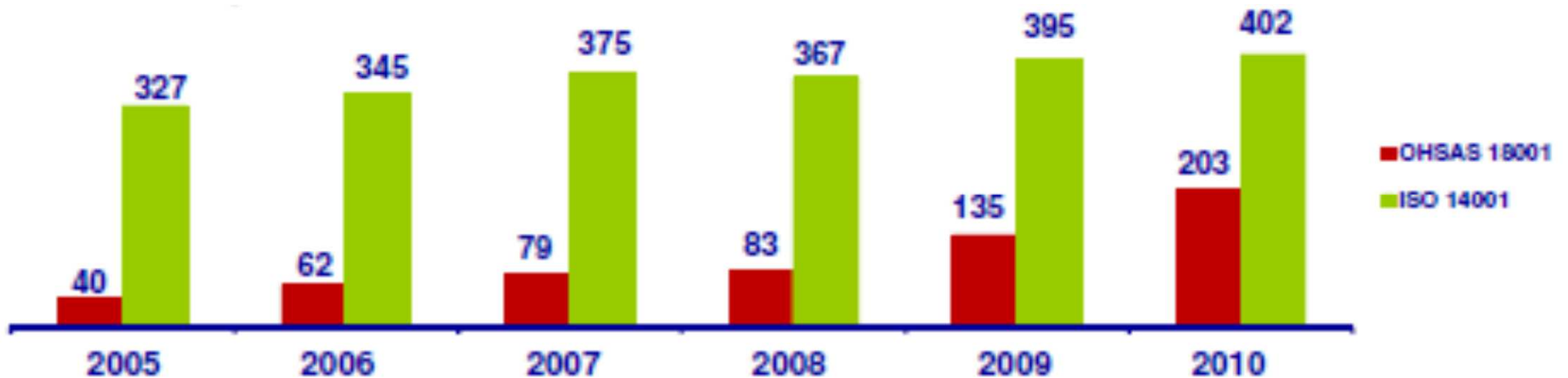
ISO 50001

Energy Management System

ISO 14064, ISO 14067

Carbon Footprint of an organization or product

Production units and/or logistics certified ISO 14001 and OHSAS 18001 in the chemical industry



Directive 2008/99/EC

- This Directive establishes measures relating to criminal law in order to protect the environment more effectively.
- Member States shall ensure that certain conduct damaging the environment constitutes a criminal offence, when unlawful and committed intentionally or with at least serious negligence

Decree 121/2011

Decree 231/2001 introduced since 2001 a regulation of administrative liability on enterprises for certain offences, committed to its advantage.

In year 2011 (Decree 121/2011), certain environmental offences have been added, under the transposition of Directive 2008/99/CE.

Decree 231/2001 provides the exemption from this liability if the enterprise can demonstrate to have adopted and properly actuated an organization, management and control system, suitable for the prevention of such offences.

Environmental offences in Decree 121/2011 deal with:

- Habitat & protected species
- Water pollution
- Waste management
- Air pollution
- Sea pollution from ships

Decree 121/2011: how to respond

- Analysys of the risks to the environment associated to the production.
- Updating of the existing organisation.
- Implementation of a new organisation, compliant with the decree.
- Need for customized solutions.
- Big enterprises are more reactive and ready for acknowledgment than SMEs.
- ISO14001 or EMAS III Models can be a reference

Decree 121/2011: services

ANALYSIS & DESIGN

- Analisi / aggiornamento dei rischi ambientali
- Adeguamento / implementazione dei modelli organizzativi previsti dal D.Lvo 231/01, relativamente ai temi ambientali (da / fino a ISO14001 e/o EMAS III)

ACTIVATION AND MANAGEMENT

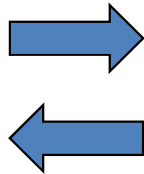
- Supporto nell'attuazione di quanto previsto dal modello organizzativo in materia ambientale

MONITORING AND SURVEILLANCE

- Partecipazione o supporto sui temi ambientali all'Organismo di Vigilanza

Decree 121/2011: expertises needed

Detailed
knowledge of
production process



- Legal: environmental legislation and associated jurisprudence.
- Sistem theory: HSE and EMS.
- Environmental: matrices and environmental processes.

Environmental Service about Toxicology

- Analysis of toxicity, Laboratory Analysis;
- Developing environmental standards;
- Toxicological evaluations (including tests pharmacokinetic data);
- Peer review of the toxicological basis of environmental standards;
- Hazards Identification (determination and identification of health impacts of chemicals);
- Dose-response assessment - determining the degree of exposure necessary to cause health effects, and quantification of a possible link between the degree of exposure (dose) and toxicity (response);
- Legal support.

Environmental Service about REACH

Compliance with REACH:

- REACH audit
- Preparing for inspection of the competent authorities
- Support to countries outside the EU

Strategic Planning for REACH:

- Identification of the roles, obligations and deadlines of the company
- Inventories of Chemicals
- Communication along the supply chain

Assistance (administrative and technical) in SIEF and Consortia

Services of Third Party Representative (TPR)

Services related to testing and monitoring:

- Management of laboratories performing tests under REACH (chemical and physical tests, toxicological, ecotoxicological)
- Monitoring the quality of workplace
- Monitoring of environmental quality

Environmental Service about REACH

REACH registrations:

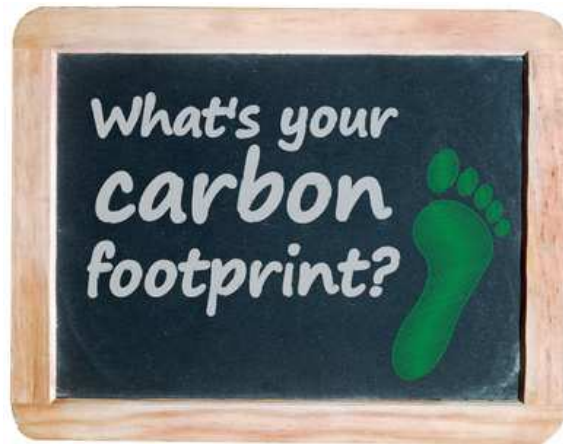
- Hazard assessment: assessing the quality of existing data (including the assignment of Klimisch score), missing data analysis, evaluation of the applicability of the "read-across" and (Q) SAR for the generation of new data, research literature, preparation of testing proposals and cost estimates, classification and labeling
- Exposure assessment and risk assessment: modeling of occupational exposure and exposure of consumers and the environment (using software such as ECETOC TRA, RISKOFDERM, ART, Stoffenmanager, EUSES, Chesar)
- Preparation of technical dossiers: Chemical Safety Assessment (CSA), Chemical Safety Report (CSR) and Exposure Scenarios (ES), insert data in IUCLID 5

Preparation, revision and updating of Safety Data Sheets (SDS) including the creation of Exposure Scenarios for Extended Safety Data Sheet (e-SDS)

Notification of substances of very high concern (SVHC) added in the "Candidate List"

Classification and labeling of

Notification / registration of chemicals in countries outside the EU (eg Turkey, China, Korea, Japan, Canada, Australia, USA).



Carbon Management

- Since the entering into force of the Kyoto Protocol in 2005, public and private entities started to monitor their CO₂ emissions. In some cases this is due by law, such as for the EU Emissions Trading, in other cases it is part of a voluntary sustainability policy.
- Whatever the business or social driver, managing carbon is nowadays recognized as a general management best practice, allowing to reduce costs, improve supply chain management, reduce financial and legislative risks, and discover new business opportunities and new fast growing markets.



Carbon Footprint

- Knowing your impact on Climate is at the basis of any *Carbon Management* strategy. Several international standards are available according to which it is possible to define a calculation methodology and calculate your *Carbon Footprint* in a transparent and certifiable way.



International Voluntary Carbon Reduction Programs



碳减排先锋
Defensores do Clima
クライメート・セイバーズ
Climate Savers

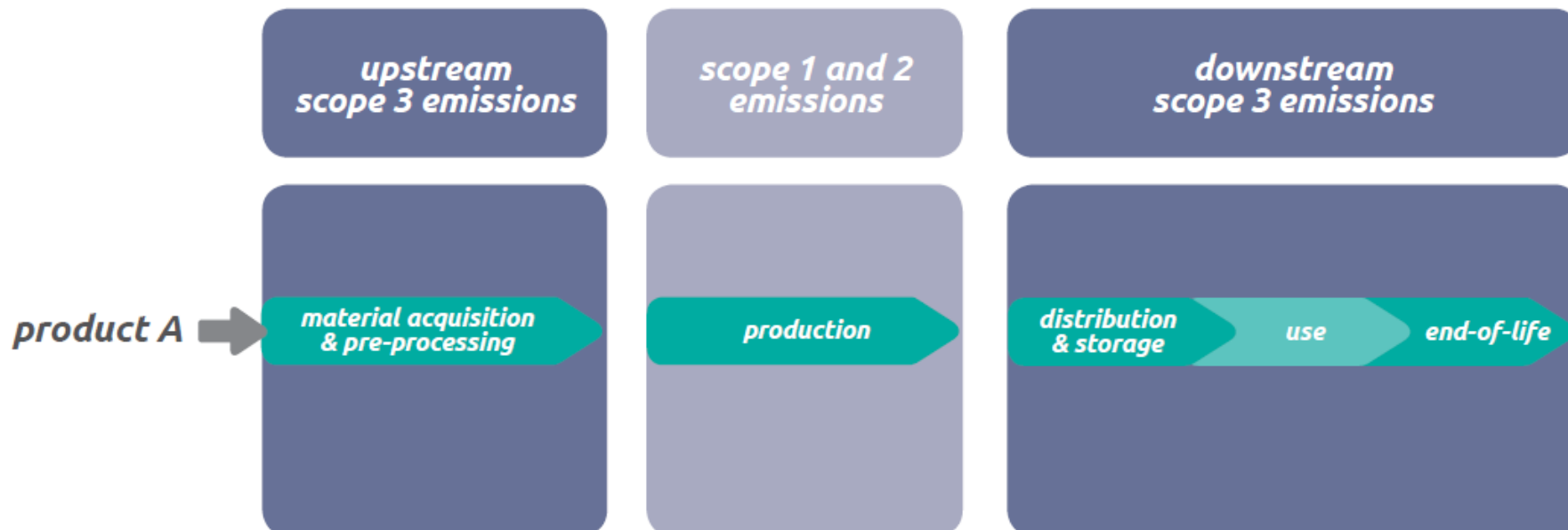


The CRC Energy Efficiency Scheme (previously known as the Carbon Reduction Commitment) is a mandatory carbon emissions reporting and pricing scheme to cover all organisations using more than 6,000MWh per year of electricity (equivalent to an annual electricity bill of about £500,000).

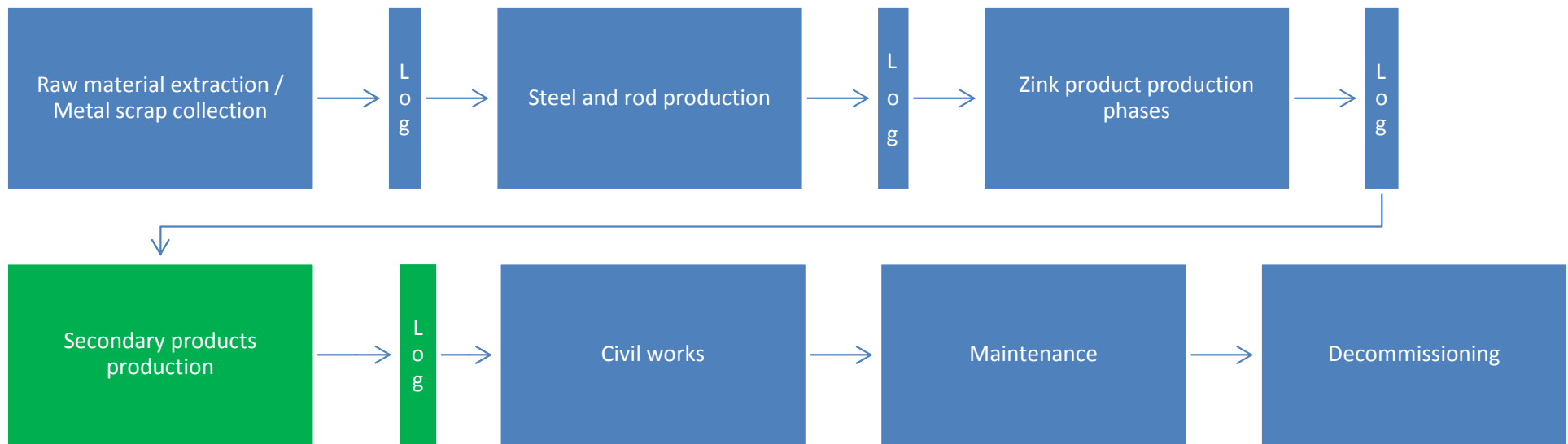




Gas ad Effetto Serra	Formula Chimica	GWP ¹
Anidride carbonica	CO ₂	1
Metano	CH ₄	23
Protossido d'azoto	N ₂ O	296
HFC-23 (Idrofluorocarboni)	CHF ₃	12000
HFC-134a	CH ₂ FCF ₃	1300
Esafluoruro di zolfo	SF ₆	22200
PFC-14 (Perfluorocarburi)	CF ₄	6500
PFC-116 (Perfluorocarburi)	C ₂ F ₆	9200



Carbon footprint of a zink coated product



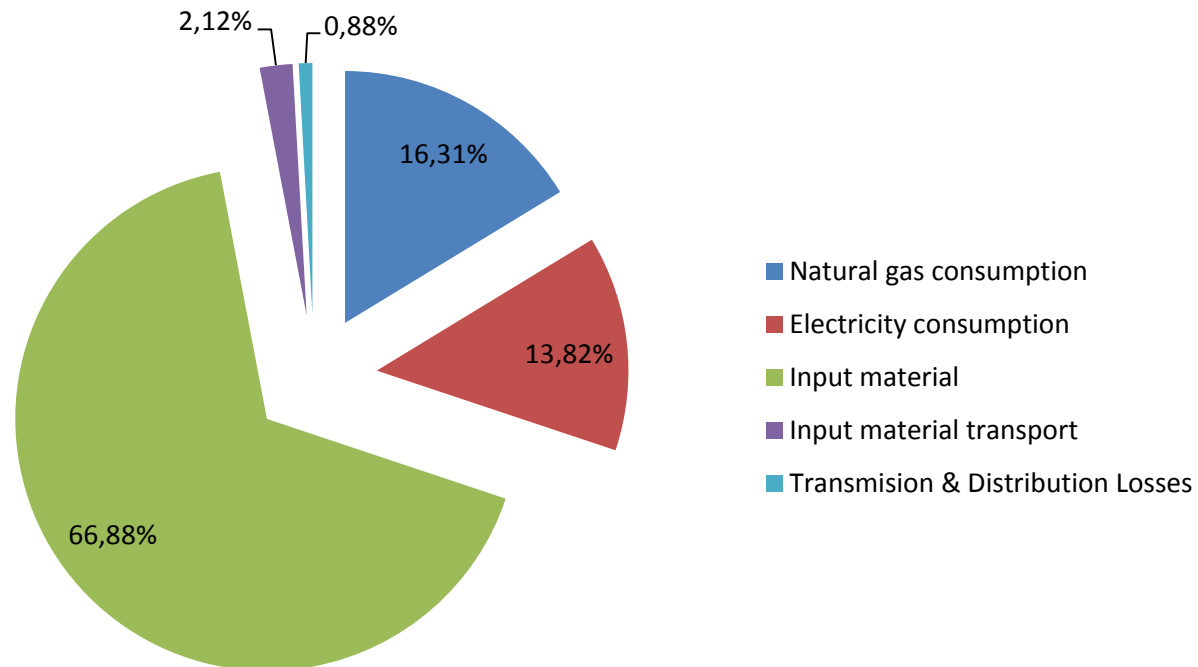


Difference among upstream processes

Zinc, Process: Waelz Kiln	t CO ₂ eq/t	3,66	IPCC 2006
Zinc, Process: Pyrometallurgical (Imperial Smelting Furnace	t CO ₂ eq/t	0,43	IPCC 2006

CF of a Zink Coated Product

Production of a zink coated product





Energy Audit – Surface Treatment Plant

Tipologia misura	Descrizione misura	Costo stimatato	Risparmio stimato	PBT
		€	€/anno	anni
Produzione energia elettrica				
	Installazione di un sistema fotovoltaico da 113 kWp film sottile telloruro di cadmio (dati indicativi: vedasi offerta allegata).	420.000	60.000	8
Produzione energia termica				
	Installazione di un sistema solare termico per la produzione di acqua calda sanitaria e di processo, e per l'integrazione dei consumi per riscaldamento invernale. Il prezzo indicato è puramente indicativo e non supportato da un'offerta specifica.	40.000	18.000	2,2
	Produzione di parte dell'acqua calda sanitaria di processo e per il riscaldamento invernale mediante il recupero di calore dalla centrale aria compressa. Vedasi misure aria compressa.	n.a.	n.a.	n.a.



Energy Audit – Surface Treatment Plant

Sistemi ausiliari					
	Utilizzo durante le ore notturne del compressore 40 HP dotato di funzione 'off'		0	2.000	n.a.
	Individuazione e rimozione perdite mediante campagna misure ultrasuoni	1.000		8.000	0,1
	Sostituzione dei due compressori 40 e 50 con un unico compressore a velocità variabile e dotato di kit recupero calore	30.000		16.500	1,8
	Sfruttare illuminazione naturale pre-press	n.a.		n.a.	n.a.
	Retrofit lampade Master TL-D Eco	tbd		tbd	0,4
	Sostituzione Corpi illuminanti con Apparecchi con reattori HF-Select	tbd		tbd	4
	Sostituzione corpi illuminanti e installazione Sistemi di Controllo	tbd		tbd	2,9
	Totale senza impianto fotovoltaico	71.000		45.000	1,6
	Totale misure tecnologiche	491.000		105.000	4,7

Emissions Trading

Assistance to those companies falling into the scope of the **EU Emissions Trading System, as defined by Directive 2003/87/EC** and its following amendments. The service a 'turn-key' assistance, adaptable to your specific needs; it includes:

- Assistance in obtaining, updating, revoking your emissions permits.
- Creation and updating of your Monitoring Plan
- Preparation of annual verification of emissions, assistance during third party audit
- Assistance to the Trading of your CO2 emissions, definition of a compliance strategy
- Assistance in Emissions' registry operations
- Assistance in handling relations with Public Authorities and Verification Institutions
- Legislative updates

