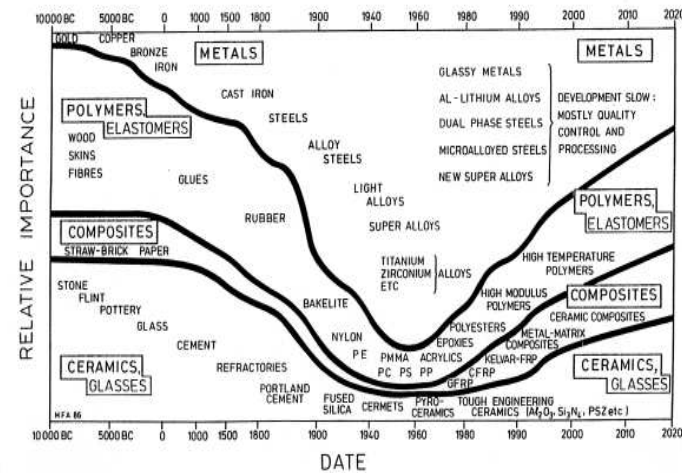
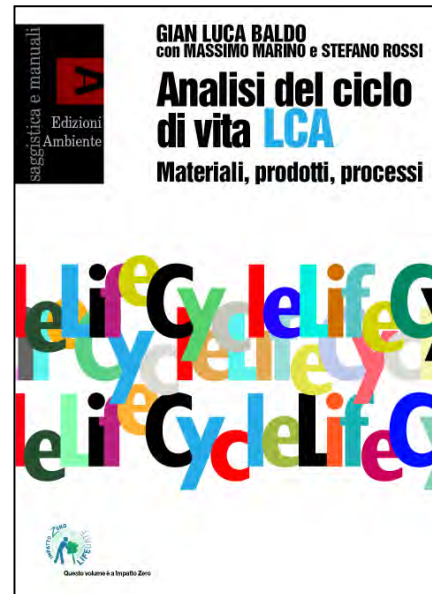


LA SOSTENIBILITA' AMBIENTALE DEL PVC



Stefano Rossi
Gian Luca Baldo
Leonardo Maffia
Life Cycle Engineering, Torino

Life Cycle Engineering: research & consulting



Studio LCE, Life Cycle Engineering Research & Consulting, is an Engineering Studio based in Turin (Italy), operating in the field of Life Cycle Assessment (LCA), sustainable development and eco-design with a considerable experience in consultancy service and education programs. The activities at Studio LCE start in 1993 with a research Ph.D. plan of Gian Luca Baldo (at present, ordinary member and legal representative of Studio LCE) in environmental Life Cycle Assessment (LCA) and sustainability at Politecnico di Torino.

In 1995 Studio LCE joins Boustead Consulting Ltd., an English research & consulting company, worldwide leader in LCA activities, with the goal of expanding the market in Italy and other Mediterranean countries. The consultancy activity serves various big industrial companies in Italy (such as ENEL, SIEMENS, FIAT, IRI, IRI/STET, and ABB) and the Studio LCE staff has the possibility to reinforce the experience also working with Dr. Ian Boustead at European level.

In 1999 Gian Luca Baldo and Massimo Manno (at present, ordinary member and scientific co-ordinator of Studio LCE) officially establish Studio LCE, Life Cycle Engineering Research & Consulting (Studio Ingegneri Associati) located in "Environment Park", the Science and Technology Park of the City of Turin, devoted to environmental technologies. By now, several projects at national and international level are developed and an extensive description of activities is available on our internet site www.studiolce.it.

Both ordinary members of Studio LCE have a research contract with Politecnico di Torino for teaching LCA and eco-design in different courses at Engineering faculty and for managing LCA tasks in national, European and International projects. The long term collaboration with Politecnico di Torino, allows Studio LCE to participate in various European and International projects (i.e.

INCO, CRAT and GROWTH) projects sponsored by the European Commission). This activity is a strategic opportunity for Studio LCE staff to work, with international level partners and to lead Studio LCE to an improved consulting service on the National scale.

Actually, Studio LCE is a well known research & consulting company in Italy for LCA and environmental issue evaluations. Studio LCE is a recognized partner of different companies and research centers at national level and is also working to support the Swedish Environmental Management Council in the Environmental Product Declarations (EPD) development and diffusion in Italy.

Since 1999, Studio LCE is also the Italian base of Granta Design Limited, an English Company established by Prof. M. Ashby of Cambridge University. Granta Design Ltd. is worldwide leader in Data Management for materials selection for design. The collaboration with Granta Design Ltd. produces services like promotion, diffusion and training of Cambridge Engineering Selector, a software for materials and processes selection based on Ashby "bubbles" methodology.

Recently, Studio LCE became consultant of the European Commission (DG XII) for a new product-group Eco-label criteria development (hard floor coverings); during the project, Studio LCE was in charge of technical aspects and of the "Ad Hoc Working Group" co-ordination at European level. Following this project, Studio LCE was appointed to diffuse the Eco-label in Italy with particular regard to the hard floor coverings sector.

Important activities for Studio LCE are also implementation of environmental management systems according to ISO 14001 and EMAS as well as educational activities in LCA and eco-design (company seminars and higher education). Studio LCE is represented by Gian Luca Baldo in the International Journal of Life Cycle Assessment Editorial Board.

- **15 years** on **LCA and eco-design** subject
- More than **50 LCA studies** performed for national and international Clients
- First in Italy for **EPD** certificated declarations
- Partner of **Boustead Consulting Ltd.** and **Granta Design Ltd.**

BOUSTEAD CONSULTING LTD

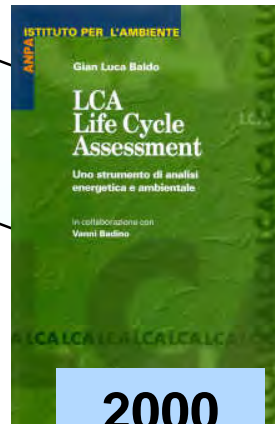


- Consultants of DG Environment, Italian EPA
- Partner of many industries (food included), manufacturing associations

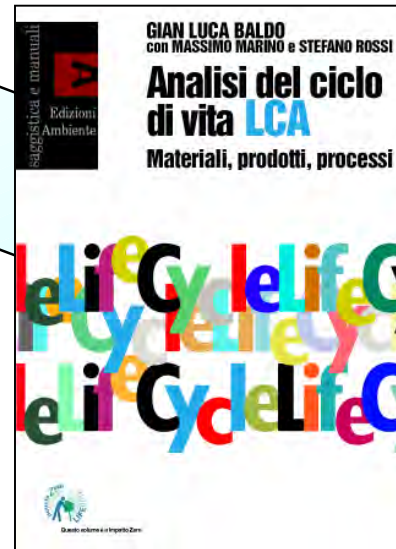
Chi siamo



1998



2000



2005

Life Cycle Engineering is working on Life cycle Assessment and sustainability since the early '90

WWW.STUDIOLCE.IT

OUR PARTNERS

BOUSTEAD CONSULTING LTD

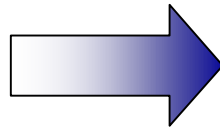


**Under
publication**

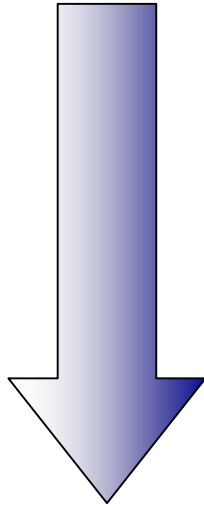
TODAY

Materiali e prodotti: Life Cycle Thinking

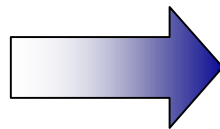
MATERIALI



PRESTAZIONE-
TECNOLOGIA - COSTI -
SOSTITUIBILITA' –
INTENSITA' ENERGETICA



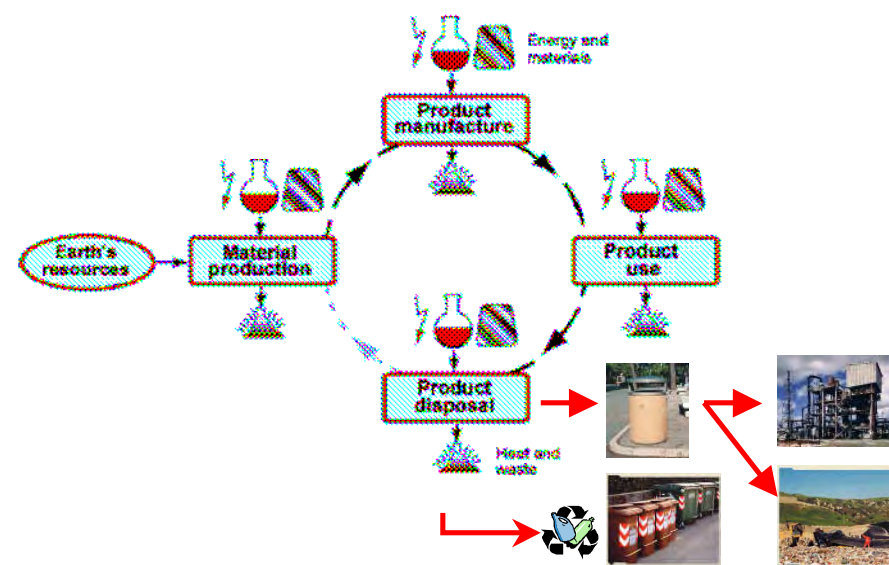
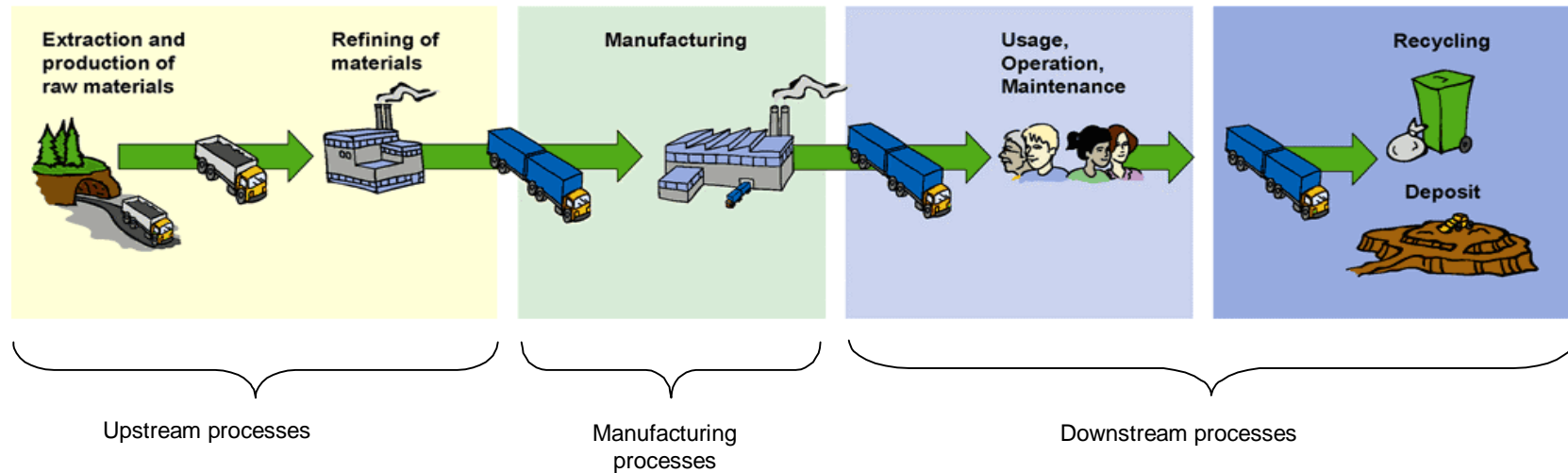
PRODOTTI



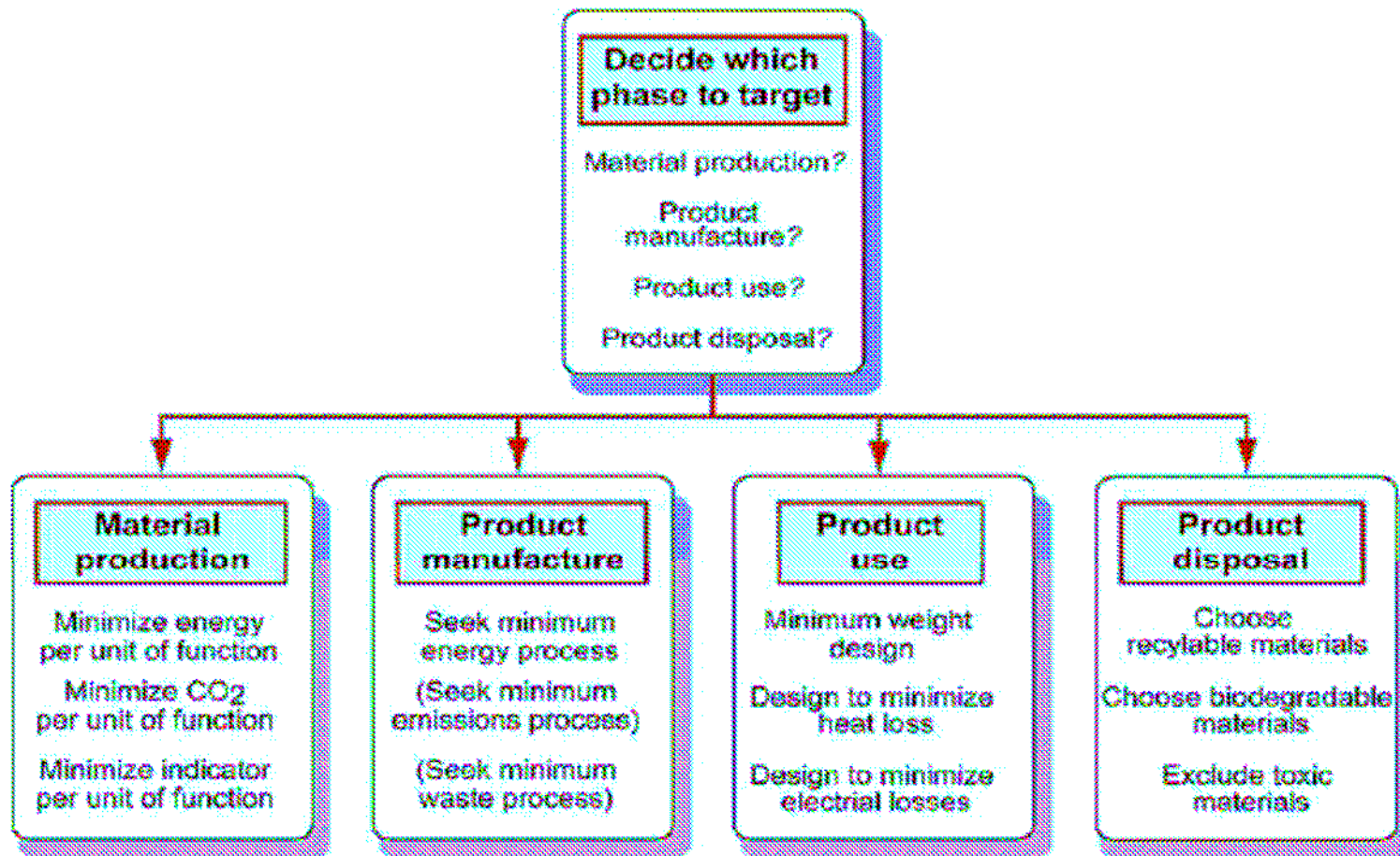
FUNZIONALI, DI QUALITA'.....,
ECO-EFFICIENTI,
RICICLABILITA'

NON HA SENSO PARAGONARE
MATERIALI MA **FUNZIONI**
(PRODOTTI) REALIZZABILI CON
MATERIALI DIVERSI

Life Cycle



Dal design all'eco-design

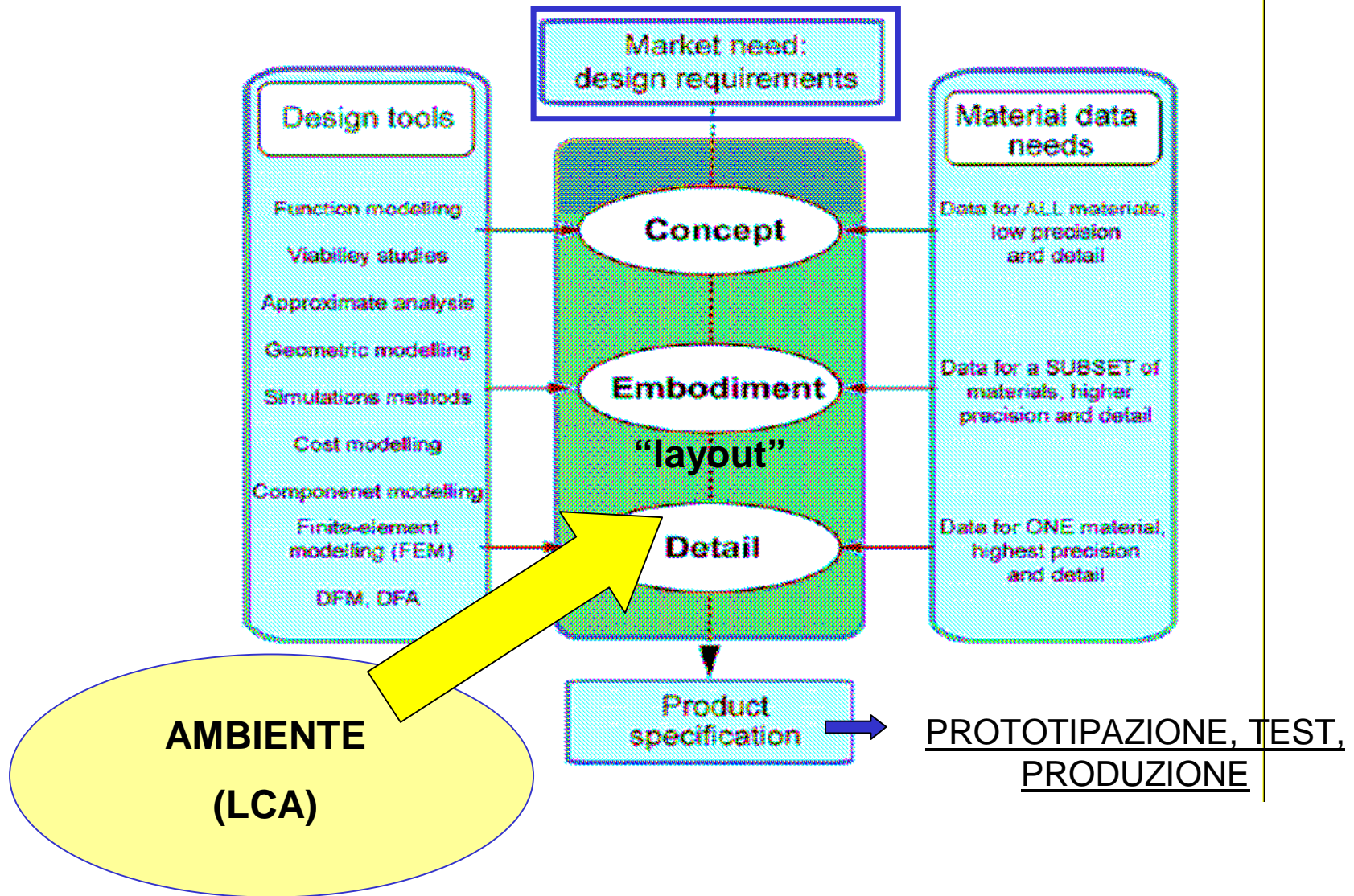


Dal design all'eco-design



UNIVERSITY OF
CAMBRIDGE

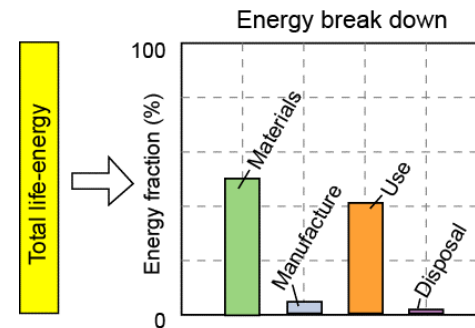
GRANTA
MATERIAL INTELLIGENCE



Il Carico ambientale

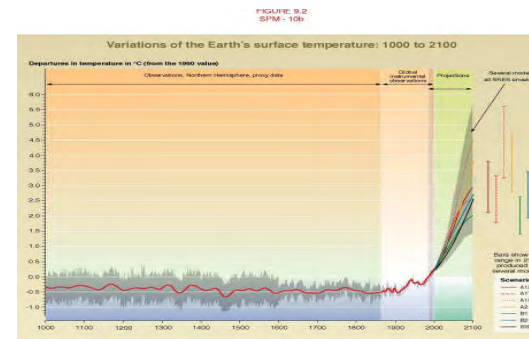
ENERGIA PRIMARIA

(RINNOVABILE/NON RINNOVABILE)



MATERIE PRIME (RINNOVABILI/NON RINNOVABILI)

EMISSIONI IN ARIA (per calcolare il **GLOBAL WARMING POTENTIAL**)

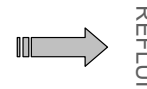
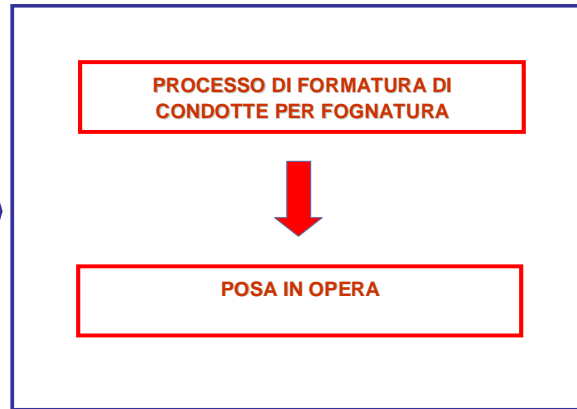
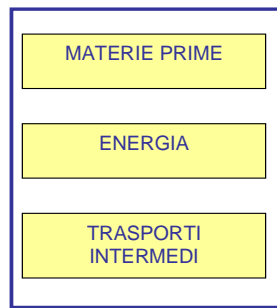


EMISSIONI IN ACQUA

RIFIUTI SOLIDI

IMPATTI A SCALA LOCALE

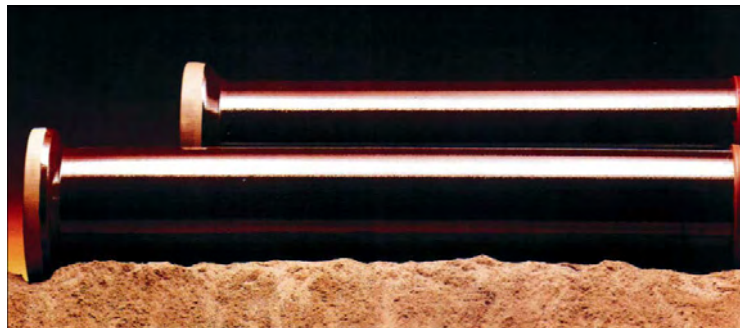
PROGETTO CONDOTTE FOGNARIE



OUTPUT
60 m di tubazione

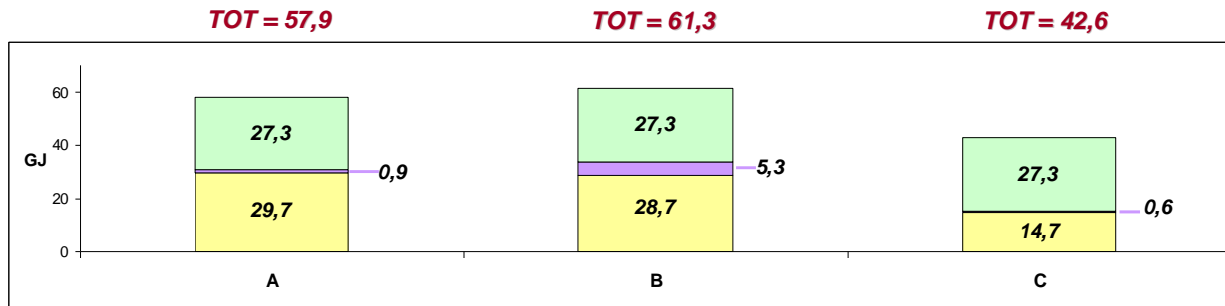
	DN250	DN630	
PVC - U	Massa 60 m	454,3	2828,8 kg
	Pezzi	10	10 Tubi
	Pezzi	20	20 Guarn. Manicot.
Gres	Massa 60 m	3060,0	13200,0 kg
	Pezzi	30	24
	Massa PU	47,3	197,1 kg
PE corrugato	Massa 60 m	174,0	1062,0 kg
	Pezzi	10	10 Tubi
	Pezzi	20	20 Guarn. Manicot.
PE corrugato	Massa tubo PE	174,0	1062,0 kg
	Massa Guarnizioni	3,0	45,4 kg
	Massa Manicotti	3,6	35,5 kg

	Tubi PVC-U	Tubi Gres	Tubi PE corrugato
Tipologia	PVC-U SDR 41 SN 4 kN/m ² DN 250 massa = 7,6 kg/m	Gres SN 160 kN/m ² DN 250 massa = 51,0 kg/m	PE corrugato SN 4 kN/m ² DN 250 massa = 2,9 kg/m
	PVC-U SDR 41 SN 4 kN/m ² DN 630 massa = 47,1 kg/m	Gres SN 95 kN/m ² DN 600 massa = 220,0 kg/m	PE corrugato SN 4 kN/m ² DN 630 massa = 17,7 kg/m



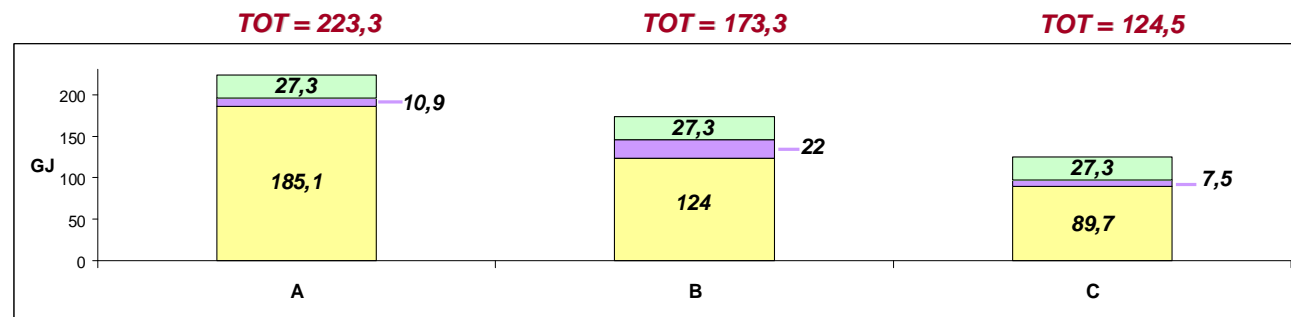
RISULTATI ENERGETICI (GJ/60m)

DN250



- Pipe production
- Pipe connection system
- Installation phase

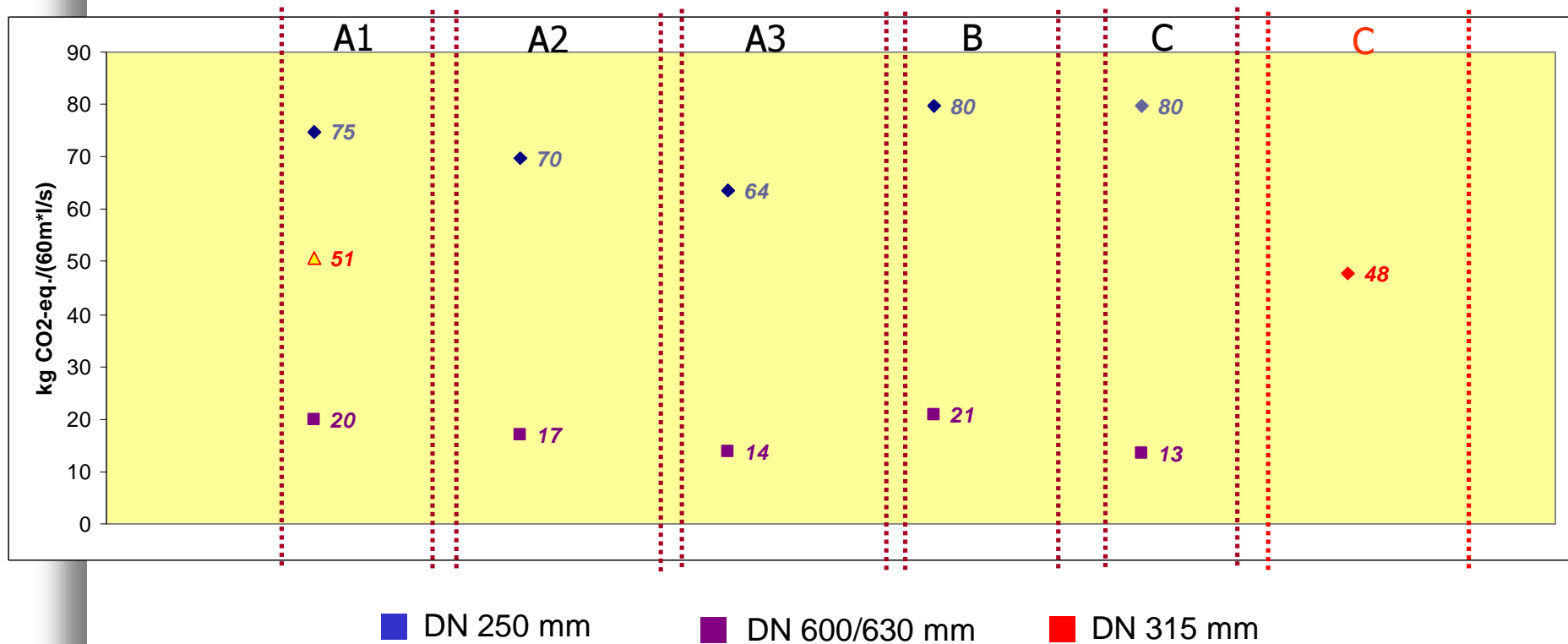
DN630 (DN600 - Gres)



- Pipe production
- Pipe connection system
- Installation phase

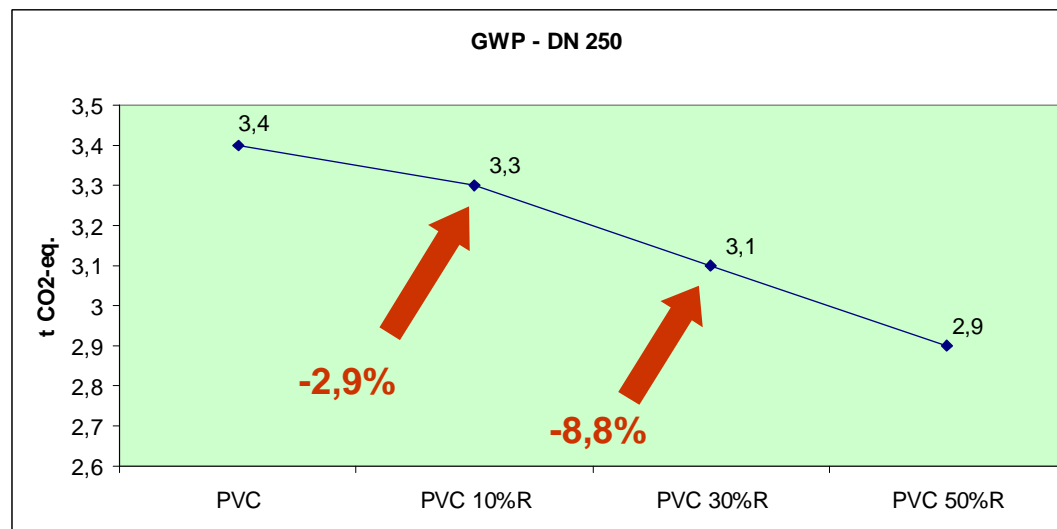
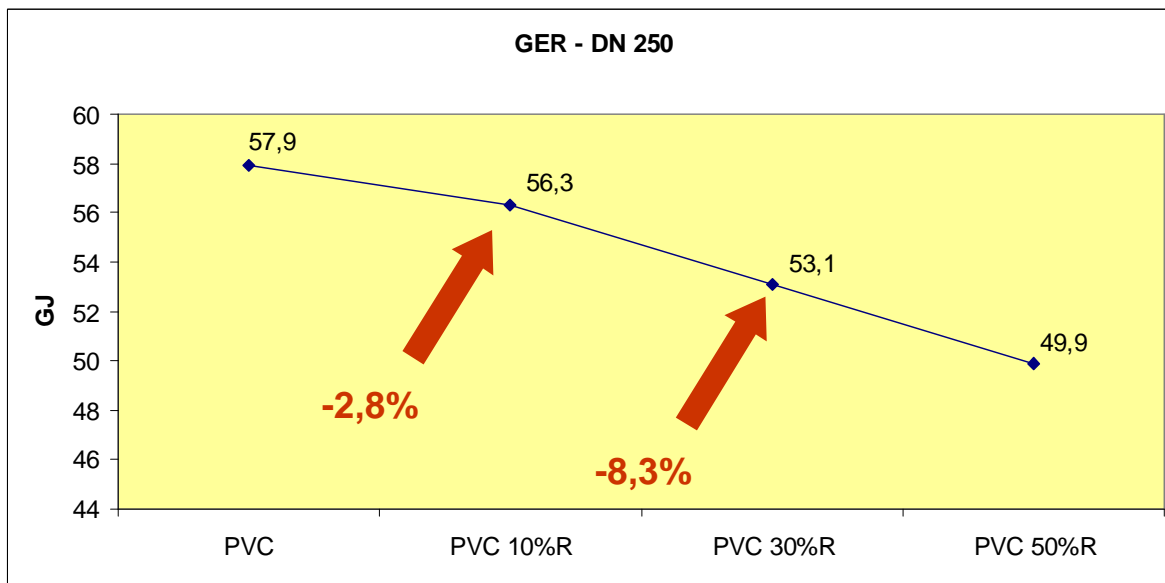
APPROCCIO RIGOROSO: PORTATA

GWP
kg CO₂-eq./[60 m * (l/s)]















Slope = 5 m/km

RICICLO PVC: ANDAMENTO DI GER E GWP f(%R)



COME COMUNICARE I RISULTATI OTTENUTI

Target \ Goals	Day to day HSE management	Communicate sustainability performance	Support brand and company reputation
Internal Stakeholders	ISO 14001 OHSAS 18001 SA 8000 ISO 22000 (for food industry)	Internal communication	
Public Sector	 EMAS SA 8000	 EMAS Sustainability report 	 Environmental labels (I or III) 
Local Community	 EMAS SA 8000	 EMAS Sustainability report	
Customers	ISO 22000 (for food industry)	Sustainability report 	 Environmental labels (I or III) Environmental Claims  ISO 22000 (for food industry)
Shareholders	ISO 14001 OHSAS 18001 SA 8000 ISO 22000 (for food industry)	Sustainability report Balance sheet	 Sustainability report Balance sheet 

CHI COMUNICA (A QUALE LIVELLO)

COMPANY LEVEL: generating information, green marketing (environmental claims), benchmarking.

MANUFACTURERS ASSOCIATIONS LEVEL: generating information, participating to discussion tables for IPPC, Risk Assessment, Emission Trading, EU Directives

GOVERNMENT/PUBLIC AGENCIES LEVEL: eco-label systems, address environmental policy, green purchasing (GPP).

Dichiarazioni Ambientali di prodotto: ISO 14020

Marchio di tipo 1: **ETICHETTE**

Marchio di tipo 1: identificano l'eccellenza e sono basati su limiti prestazionali

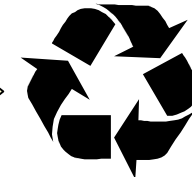
ISO 14024



Marchio di tipo 2: **ASSERZIONI**

Marchio di tipo 2: basati su autodichiarazioni dei produttori

ISO 14021



Marchio di tipo 3: **DICHIARAZIONI**

Marchio di tipo 3: marchi di tipo dichiarativo; non identificano l'eccellenza

ISO 14025



ALTRI MARCHI



CARTA DI IDENTITA' AMBIENTALE PER ACCEDERE A MERCATI GREEN PROCUREMENT

In base alla loro accessibilità e al modo in cui vengono adottati, questi sistemi di etichettatura possono o meno essere presi in considerazione in fase di definizione dei contenuti degli appalti pubblici

L'Acqua Santa Croce vince il confronto:
ha minor residuo fisso, sodio e nitrato delle più diffuse acque oligominerali italiane.

Leggi bene l'etichetta.

SANTA CROCE	ROCCHETTA	SAN BENEDETTO
residuo fisso 170,4 mg/l	residuo fisso 177,07 mg/l	residuo fisso 220 mg/l
sodio 1,23 mg/l	sodio 4,66 mg/l	sodio 6 mg/l
nitrato 1 mg/l	nitrato 1,41 mg/l	nitrato 8 mg/l

Publicità comparativa tra alcune acque oligominerali.
Fonte: ...

1.5L
RETURN FOR REFUND WHERE APPLICABLE

SODIUM FREE • CHOLESTEROL FREE

MONT[®] COLE
Canada's Finest Water

Nutrition Facts
Serving Size: 1.28 fl. oz. (4l)
About 32 Servings Per Container

Amount per Serving	
Calories	0
	%DV*
Total Fat 0g	0%
Cholesterol 0g	0%
Sodium 0g	0%
Total Carb. 0g	0%
Protein 0g	0%

not a significant source of minerals
*Percent values(DV) are based on a 2000 calories diet

OZONIZED

ANALYSIS (mg/L)			
Ca	38	Mg	8
K	2	Na	2
HCO ₃	130	Cl	3
Pb	0	Zn	0
Cu	0	Hs	0
SO ₄	24	NO ₃	0


BOTTLED BY: MONT COLE SPRING WATER INC.
QUÉBEC, CANADA T: 1-514-943-9888 F: 514-459-4232


Transparency

RICHIESTE DEL MERCATO

ISO 21930: Building construction – sustainability in building construction – Environmental declaration of building products

National "EPD-like" programmes in the building sector

 Denmark - Danish Building and Urban Research


 Finland - RTS, Building Information Foundation


 France - AFNOR, French Standardisation Organisation

 the Netherlands - Milieu Relevante Product Informatie, MRPI

 Sweden - Byggvarudeklarationer, BVD

 Switzerland - SIA, Swiss Association of Engineers and Architects

 UK - Environmental Profiles for Construction Materials, BRE

 US - Building for Environmental and Economic Sustainability, BEES



RICHIESTE DEL MERCATO, ITALIA



ISTITUTO PER LA TRASPARENZA L'AGGIORNAMENTO E LA CERTIFICAZIONE DEGLI APPALTI

“PROTOCOLLO ITACA SINTETICO”



per la valutazione della qualità energetica ed ambientale di un edificio

GPP



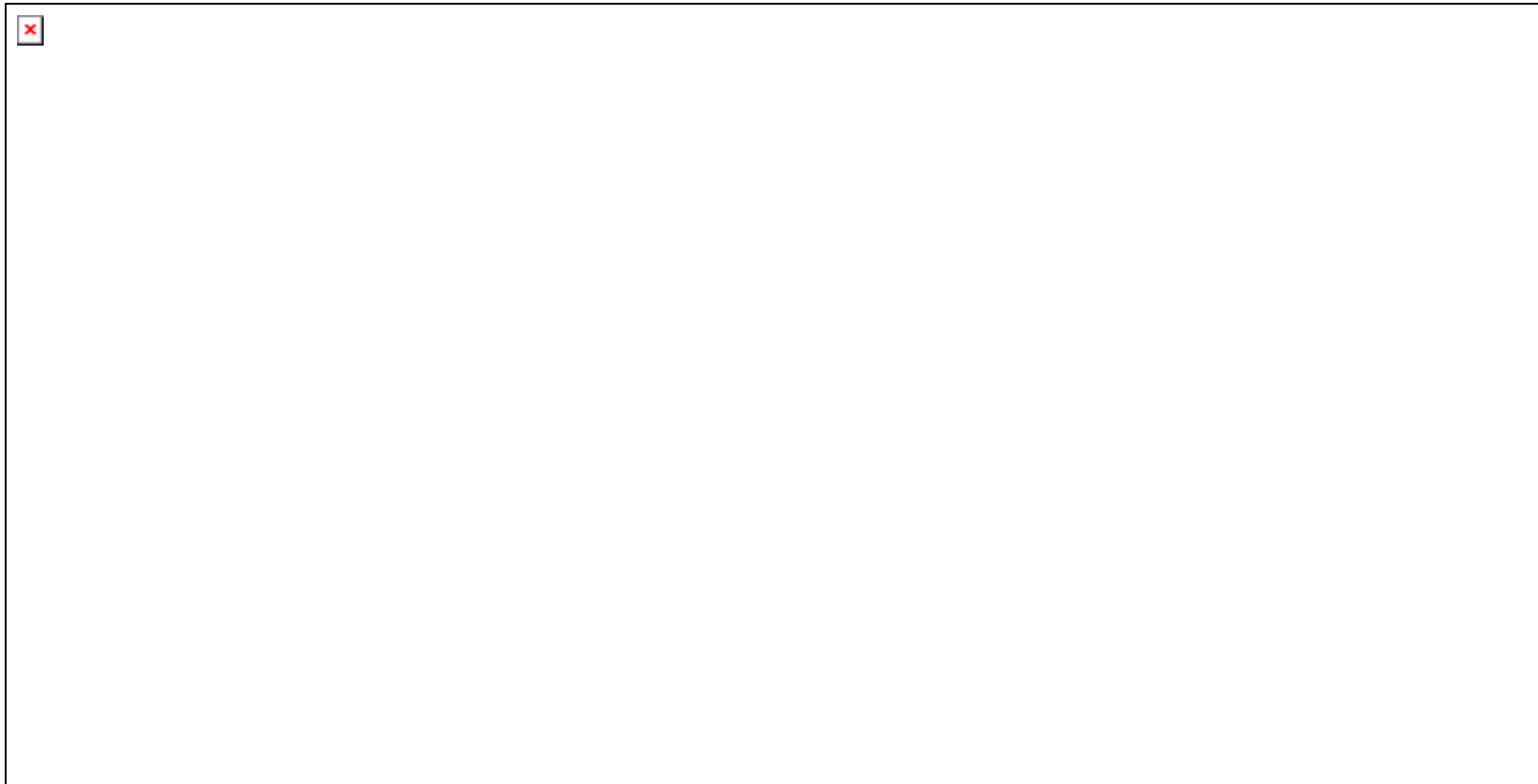
Nell'ambito della riforma complessiva del quadro normativo degli appalti pubblici, le **Direttive 2004/17/CE** e **2004/18/CE** hanno introdotto l'esplicita facoltà di far riferimento alle ecoetichette.

Il D.Lgs 163/06 “Codice dei contratti pubblici” che recepisce, tra l'altro, in ambito nazionale le citate direttive europee, fa riferimento alle ecoetichette all'art. 68 “Specifiche tecniche”.



Non è invece possibile utilizzare i criteri relativi alla gestione ambientale dell'azienda che produce il prodotto

GERARCHIA DELLE NORME PER UNA EPD



Alcune EPD DI SINGOLE AZIENDE NEL SETTORE EDILIZIA

EPD
Environmental Product Declaration

MASONRY UNITS

Produzione in Italia
Austria e Germania
Produzione in Austria
Masonry Bricks

EPD
Environmental Product Declaration

Ziegel Mattoni Gasser

Ziegel aus Südtirol seit mehr als 125 Jahren
Laterizi da Sudtirolo da oltre 125 anni
Clay bricks from South Tyrol for over 125 years

EPD
Environmental Product Declaration

Rev. 0, 11-08-08

MASONRY UNITS
Clay bricks

Ziegel Mattoni Gasser

Ziegel aus Südtirol seit mehr als 125 Jahren
Laterizi da Sudtirolo da oltre 125 anni
Clay bricks from South Tyrol for over 125 years

MATTONI
Laterizi in argilla

EPD
Environmental Product Declaration

stiferite

Dichiarazione Ambientale di Prodotto
Pannello in Poliuretano Espanso Rigido
CLASS S - 60 mm

Revisione 0 del 05 Luglio 2007 Pre - certificazione N. S-EP-00022
Valida fino a Luglio 2008

EPD
Environmental Product Declaration

METAL ZINCO
zincatura a caldo

Dichiarazione Ambientale di Prodotto

Pre-certificazione
S-EP-00013

EPD
Environmental Product Declaration

BUZZI UNICEM
Cemento Portland di Sarnese (PC)
Cemento tipo I

CEM I 32,5 N (Cemento Portland)
CEM II/A-B 32,5 N (Cemento Portland alla pozzolana)
CEM II/A-L 32,5 N (Cemento Portland al calcare)
CEM III/A-LI 42,5 N (Cemento Portland al calcare)
CEM IV/A 32,5 N (Cemento pozzolanico)

"CEMENTO MEDIO"

Pre-certificazione
S-EP-00014

EPD
Environmental Product Declaration

BUZZI UNICEM
Piane "Unicostrucci" di Sarnese (TO)
Cemento tipo I

BUCK 10
BUCK 15
BUCK 20
BUCK 25
BUCK 30
BUCK 35 - SCC

"Average Concrete"

Pre-certificazione
S-EP-00015



Altre esperienze a livello europeo

