



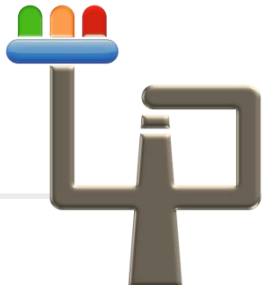
*Il linguaggio della ricerca*



# Carbon Footprint

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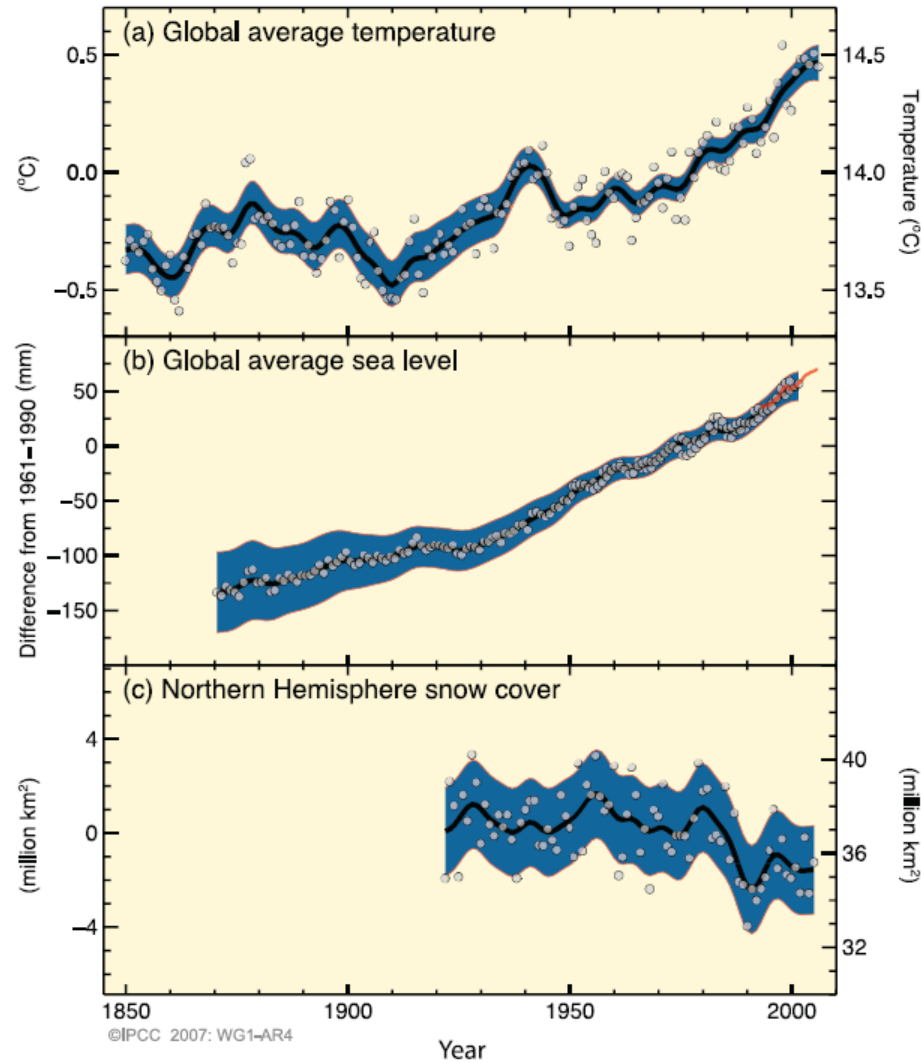
Laboratorio LECOP-LEI



- Introduzione
- Cos'è il Carbon Footprint
- Come calcolare il Carbon Footprint
- Standard metodologici
- Compensazione delle emissioni
- Conclusioni



CHANGES IN TEMPERATURE, SEA LEVEL AND NORTHERN HEMISPHERE SNOW COVER



*“Il riscaldamento globale è inequivocabile ed evidente visto l’incremento delle temperature medie di aria ed oceani, lo scioglimento dei ghiacciai e la crescita del livello dei mari”*

IPCC 4th Assessment Working Group I,  
Summary for Policymakers, 2007



- **Conseguenze sui mercati globali**
  - Conseguenze sulle rese, sui prezzi e sulla richiesta energetica, etc.
- **Incremento degli eventi meteorologici estremi**
  - Picchi di temperature e piovosità, siccità, inondazioni, etc.
- **Diminuzione della biodiversità**
  - Estinzione di specie animali e vegetali
- **Cambiamenti negli habitat di animali e piante**
  - Necessità di adattamento alle nuove condizioni
- **Innalzamento del livello del mare**
  
- **Effetti sulla salute umana**





Nel dicembre 2008 l'Unione Europea ha approvato il pacchetto europeo "clima-energia", conosciuto anche come strategia "20-20-20" in quanto prevede entro il 2020:

- Ridurre le emissioni del 20%
- Aumentare l'efficienza energetica del 20%
- Ottenere il 20% dell'energia da fonti rinnovabili

*Necessità di associare agli obiettivi delle politiche ambientali una **strumentazione idonea** per il calcolo delle emissioni di CO<sub>2</sub>*



*“Il **Carbon Footprint** è la misura dell’ammontare totale delle emissioni di gas ad effetto serra causate direttamente o indirettamente da un individuo, un’organizzazione, un evento o un prodotto.”*

**Carbon Trust**







**Metano -  $CH_4$  :**

- Rifiuti (discariche, attività naturali)
- Allevamento



**Biossido di carbonio -  $CO_2$  :**

- Combustibile per energia e trasporti
- Processi di produzione



**Idrofluorocarburi - HFC e Perfluorocarburi - PFC :**

- Refrigeranti
- Industria chimica, elettronica e di alluminio
- Spray e schiume

**Esfluoruro di zolfo -  $SF_6$  :**

- Industria elettronica

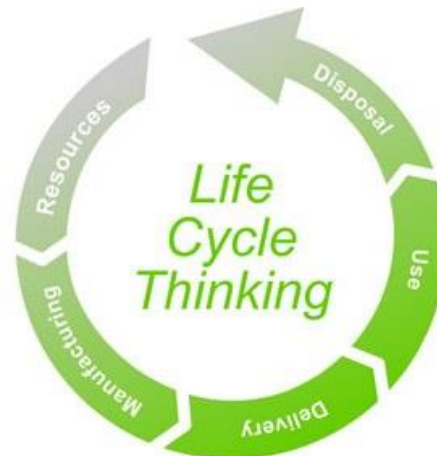


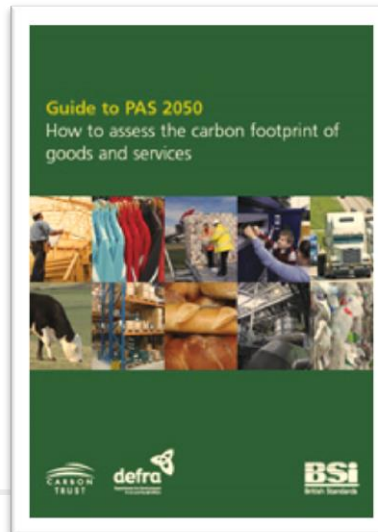
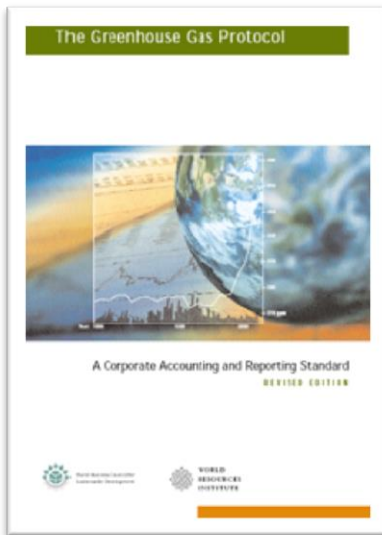
**Protossido di azoto -  $N_2O$  :**

- Industria chimica
- Agricoltura - Allevamento



- Analizzando un processo produttivo, un attività o un servizio secondo un approccio di ciclo di vita
- Sommando le quantità, calcolate in kg di CO<sub>2</sub> equivalenti, di una serie di gas ad effetto serra (non solo anidride carbonica)
- Cercando di incorporare tutte le emissioni, sia quelle **dirette** che quelle **indirette**





**(Dati sulle attività) x (fattore di emissione) = kg CO<sub>2</sub> eq**



## GAS SERRA

## GLOBAL WARMING POTENTIAL

<b>CO<sub>2</sub></b> (anidride carbonica)	<b>1</b>
<b>CH<sub>4</sub></b> (metano)	<b>21</b>
<b>N<sub>2</sub>O</b> (biossido di azoto)	<b>310</b>
<b>HFCs</b> (idrofluorocarburi)	<b>140-11700</b>
<b>PFCs</b> (poliflorocarburi)	<b>6500-9200</b>
<b>SF<sub>6</sub></b> (sulfurhexafluoride)	<b>23900</b>

[IPCC - Intergovernmental Panel on Climate Change; [www.ipcc.ch](http://www.ipcc.ch)]



### Il Carbon Footprint come strumento per:

- **Quantificare e localizzare** le fonti di emissione
- Analizzare le **opportunità di miglioramento**
- Avere un **referimento per confrontare** le proprie performance con possibili competitori
- **Ottenere un marchio** per il proprio prodotto/servizio





All material is draft and subject to change © WRI & WBCSD 2009



## Emissioni di CO<sub>2</sub> eq. per chilometro per alcuni modelli di automobile



Fonte: Ministero delle Attività Produttive - IVI

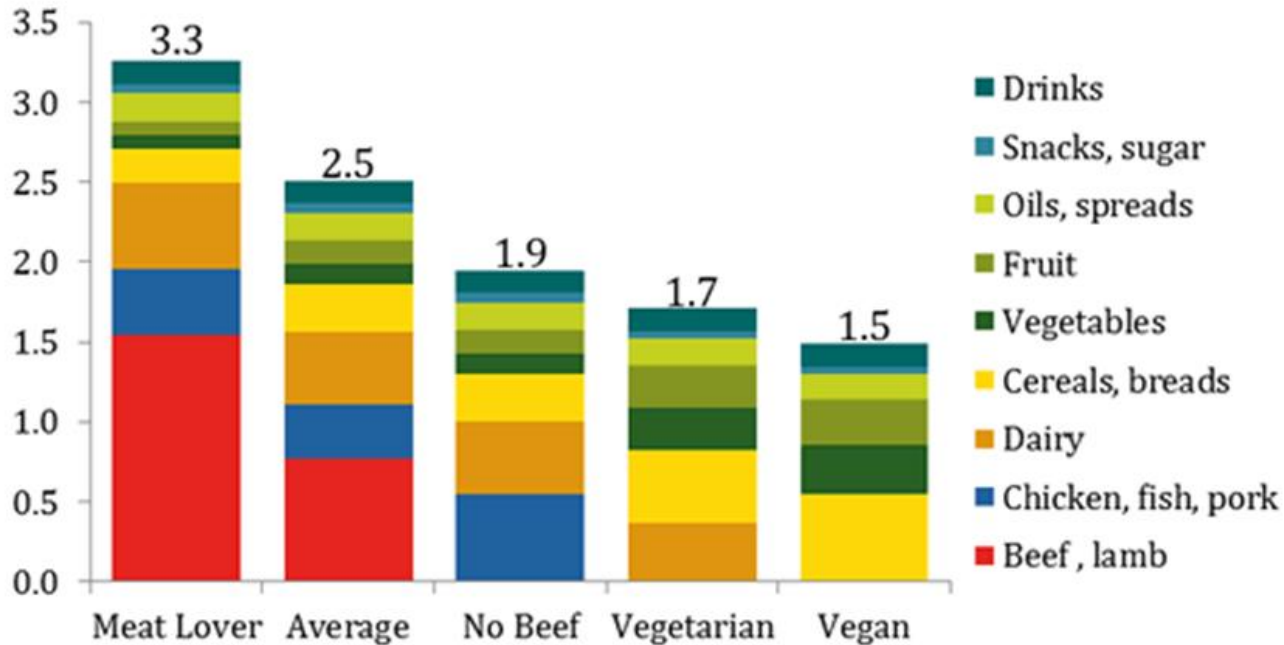




Fonte: Barilla Center for Food and Nutrition.



## Foodprints by Diet Type: t CO<sub>2</sub>e/person



Note: All estimates based on average food production emissions for the US. Footprints include emissions from supply chain losses, consumer waste and consumption.. Each of the four example diets is based on 2,600 kcal of food consumed per day, which in the US equates to around 3,900 kcal of supplied food.

Sources: ERS/USDA, various LCA and EIO-LCA data



**OILCA**  
OLIVE OIL LIFE CYCLE ASSESSMENT

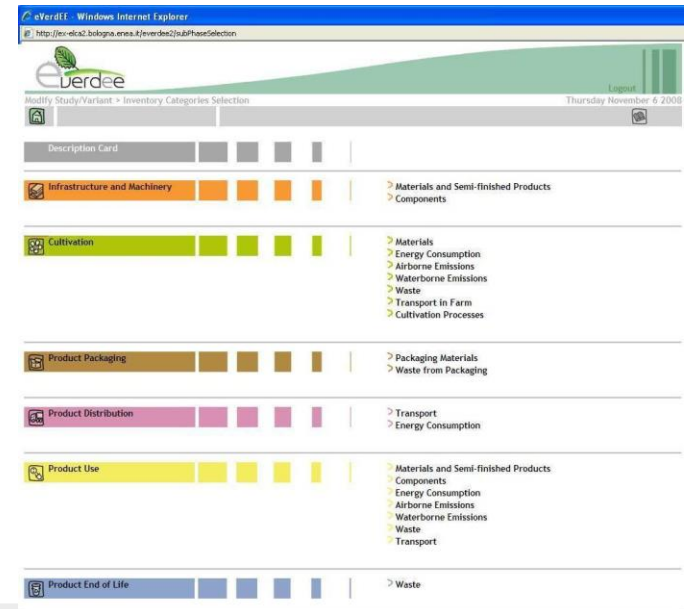
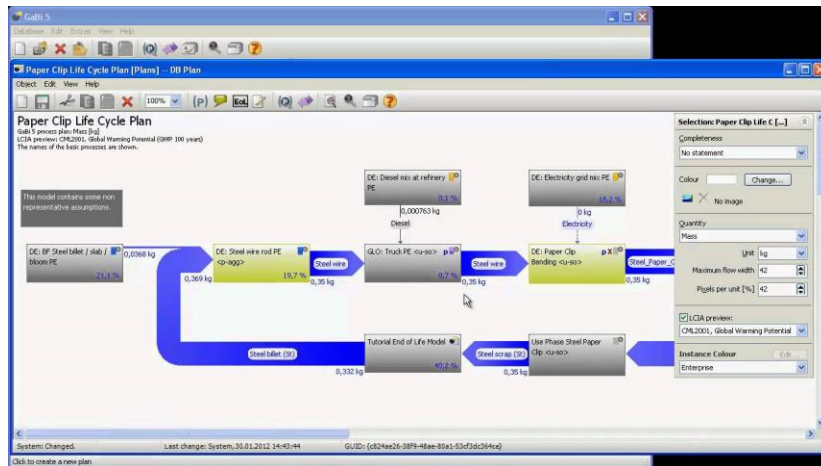
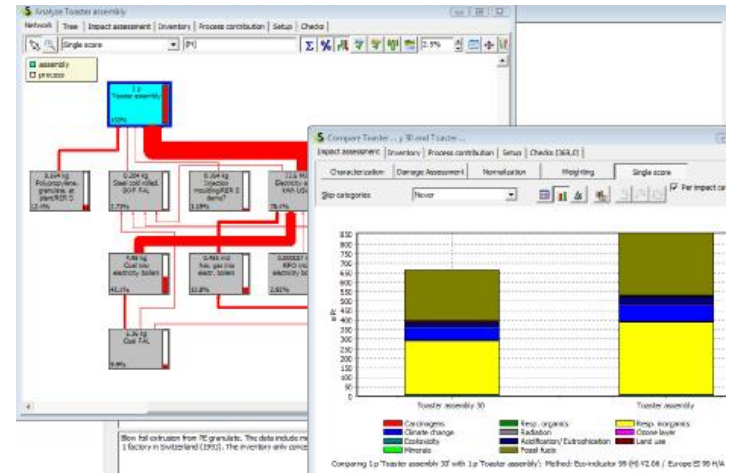
ESTUDIO AMBIENTAL Y ECONÓMICO EN EL PROCESO DE OBTENCIÓN DEL ACEITE

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OILCA 2012  
DISEÑOWEBNED



**FOOD CARBON EMISSIONS CALCULATOR** brought to you by **CleanMetrics™**

Calculator    FAQ

Step 1    Select a food category    Beans & Pulses

Step 2    Select a food commodity    Dry Beans

Step 3    Set long-distance truck transport (miles)    1400

Step 4    Set quantity purchased by consumer (pounds)    1.0

Step 5    Set consumer waste percentage    0.0

Calculate food emissions

Production region	
Product form	
Production emissions	0.45
Transport emissions	0.23
Waste emissions	0.00

Notes:

- \* All food carbon emissions are reported above in kg of CO<sub>2</sub>e, including major greenhouse gases such as carbon dioxide, methane and nitrous oxide.
- \* Production emissions are for the production (cradle to farmgate) and any processing of quantity purchased.
- \* Transport emissions are for the transport of quantity purchased: local transport, any ocean transport, and user-defined long-distance truck transport.
- \* Waste emissions are for the landfilling of quantity wasted (with typical waste energy recovery).
- \* Packaging and cooking are not included.

# EAT LOW CARBON

Are you concerned about climate change?

Well, now that you've changed your lightbulbs, it's time to change your lunch!

IS MY CHEESEBURGER CAUSING GLOBAL WARMING?

DIET TIPS    FOOD SCORES    TAKE THE QUIZ

The food system is responsible for a third of global greenhouse gas emissions. Learn how to reduce your carbon "foodprint."

BON APPÉTIT MANAGEMENT COMPANY

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[www.foodemissions.com](http://www.foodemissions.com)  
[www.eatlowcarbon.org](http://www.eatlowcarbon.org)

- La compensazione è uno strumento volontario nato per riconoscere la propria responsabilità delle emissioni
- Permette l'acquisto di crediti per bilanciare le emissioni prodotte

Deve:

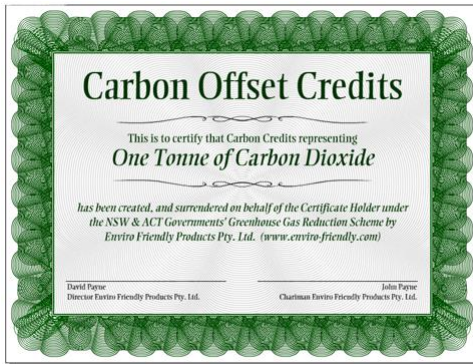
- Essere legato a progetti specificatamente nati per questo scopo
- Avere una ampia azione di educazione ambientale
- Rispondere a standard internazionali



■ Possibili progetti:

- Energie rinnovabili
- Efficienza energetica
- Riforestazione e afforestazione
- Cattura delle emissioni di metano
- Carbon sequestration





**MaLplaas Carbon Offset Certificate**

Mr & Ms Human

This certifies that

# EXAMPLE

have offset carbon emissions through energy efficiency and supporting the MaLplaas Carbon Offset Project that benefits both environment and community.

The holders of this certificate also pledge to pursue whatever possible measures to further reduce their personal impact on global warming.

Total CO<sub>2</sub>e offset: 10.23 Tonnes  
Period of offset: 30 June 2008

We would prefer that you did not print this certificate and opted instead for a leaf on the MaLplaas Tree of Life or used the MaLplaas Carbon Offset Project Wallpaper version for your computer. But we do realise the only way we can spread the word is by communication so BE PROUD of your actions and show this certificate to your family, friends and colleagues in the hope that they might follow your example!

**Thank you!**

Together we can make a world of difference, and make a difference to our world!

**firstclimate<sup>®</sup>**

**Certificate**

Climate Neutral Event  
Il processo verso la carbon neutrality  
Strumenti per il funzionamento del new deal verde  
Bologna, 25 maggio 2009

We are happy to award this climate neutral certificate to

This certificate guarantees that all (GHG) emissions generated in the course of the event (through travelling, catering, organization and energy consumption of the venue and in hotels)

**in total 10 tonnes of GHG**

are offset by an investment in the Gold Standard emission reduction project,  
**Gold Standard Wind Power Project in the Region of Marmara in Turkey.**


con la collaborazione di


Budapest, April 2009


*[Signature]*  
Dr. Sándor László, First Climate (Germany) GmbH


CC-Cert No.: 2033      www.firstclimate.com


carbon calculator [www.jpmorganclimatecare.com/](http://www.jpmorganclimatecare.com/)


flight  


car  


quick  


gift  


house  


business  


**flight emissions**

Flying from:  
 i

Going to:  
 i

Via (longhaul flights):  
 i

Passengers:

Flight type:  
 Return  One way

**carbon emissions**

0,33

tonnes of CO<sub>2</sub>

£2,82


cost to offset

1791

miles travelled

add to basket

2 buy offsets

 [1 offset\(s\) in basket](#)

currency [GBP](#) distance [miles](#)

## zerofootprint™

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### One Minute Personal Calculator

#### My Personal Carbon Manager

For a much more comprehensive tool that will manage your carbon, connect you to others with similar goals, store your favourite green businesses and keep track of your events, register for our **Personal Carbon Manager**.

Travel	Flights	Diet	Home	Total
<p><b>Typically, I drive...</b></p> <p>1000 km per year</p> <ul style="list-style-type: none"> <li><input type="radio"/> SUV/Truck</li> <li><input type="radio"/> Large car/minivan</li> <li><input type="radio"/> Medium car</li> <li><input checked="" type="radio"/> Small car</li> <li><input type="radio"/> Hybrid sedan</li> <li><input type="radio"/> Hybrid</li> </ul>	<p><b>In an average year, I take this number of one way flights:</b></p> <p>6 Short (&lt;1.5 hrs)</p> <p>Medium (1.5-4 hrs)</p> <p>0 Long (4-6 hrs)</p> <p>Extended (6-12 hrs)</p> <p>Super-ext (&gt;12 hrs)</p>	<p><b>In a typical week I eat this many servings of...</b></p> <p>3 Red meat</p> <p>4 Poultry</p> <p>3 Dairy</p> <p>4 Seafood</p> <p>Cereals + Grains</p> <p>7 Fruits, Nuts + Vegetables</p>	<p><b>I live in a...</b></p> <ul style="list-style-type: none"> <li><input type="radio"/> Detached</li> <li><input type="radio"/> Semi-detached</li> <li><input checked="" type="radio"/> Apartment or condo</li> </ul> <p><b>My home has...</b></p> <p>4 bedrooms</p> <p>4 people</p> <p><input type="checkbox"/> air conditioning</p>	
<p>0.19 Tonnes of CO2 / year</p> <p>Offset</p>	<p>1.03 Tonnes of CO2 / year</p> <p>Offset</p>	<p>1.59 Tonnes of CO2 / year</p> <p>Offset</p>	<p>1.63 Tonnes of CO2 / year</p> <p>Offset</p>	<p>4.44 Tonnes of CO2 / year</p> <p>Offset All</p>

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zerofootprint™

Retail Carbon Offset

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Offset Air Travel **Offset Any Amount**

Please enter the amount of tonnes of CO<sub>2</sub> you wish to offset. You may offset all or a portion of your carbon footprint.

Tonnes of CO<sub>2</sub> [Approx. Cost](#) 53.89 
\* For informational purpose only. You will be billed in Canadian dollars.

Or choose from the list of preset offsets below

**Home Offset**  
[more info](#)

**Vehicle Offset**  
[more info](#)

**Personal Offset**  
[more info](#)

**Total Offset**  
[more info](#)

**Travel Offset**  
[more info](#)

**Login**

Email

Password

[Forgot password?](#)

**Don't have a login?**  
[Register now](#)

54 €

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- Fornisce uno strumento di Gestione e Monitoraggio delle emissioni dei gas serra:
  - Aumenta la capacità di controllo sulle prestazioni dei processi
  - Interviene a livello di gestione e programmazione
- Fornisce dati ed informazioni a supporto delle scelte strategiche che consentono:
  - Rispetto delle prescrizioni applicabili
  - Sviluppo di nuovi prodotti
  - Miglioramento dell'immagine della azienda nei confronti di clienti ed investitori
  - Sviluppo di nuove strategie di marketing: etichette, confronto con competitori, etc



## Laboratorio di LCA & ECODESIGN per l'eco-innovazione (LEI)

Centro Ricerche ENEA Bologna  
via Martiri Monte Sole, 4  
E-mail: [lca@enea.it](mailto:lca@enea.it)

<http://www.bo.cnr.it/linguaggiodellaricerca/>

[www.ecosmes.it](http://www.ecosmes.it)

<http://www.tecnopolo.enea.it/>

[www.bologna.enea.it](http://www.bologna.enea.it)

