



# Programa Brasileiro de Avaliação do Ciclo de Vida-PBACV

Armando Caldeira-Pires  
Coordenador do CT2-Inventários/PBACV (Prof. UnB)

OFICINA 02: GT CONSTRUÇÃO/CT2/PBACV  
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## Regulamentações aplicadas a diversos setores na Europa



- The European Integrated Product Policy (IPP) concept and the rising interest in life cycle related topics (**baseado no pensamento do ciclo de vida**)
- EPD – Environmental Product Declarations (**relatórios tipo ISO14025 baseados na 14040**)
- EU directive on End-of-Life Vehicles (2000/53/EC) –Calculation of road vehicles recyclability and recoverability (ISO 22628) (**obrigatório o uso da ISO14040**)
- WEEE –Waste Electrical and Electronic Equipment (2002/96/EC and Amendment 2003/108/EC) (**obrigatório o uso da ISO14040**)
- RoHS –Restriction of hazardous substances (**obrigatório o uso da ISO14040**)
- REACH - Registration, Evaluation, Authorisation and Restriction of Chemical
- Directive on Energy Using Products (EuP) (**obrigatório o uso da ISO14040**)
- Green public purchasing program ([http://ec.europa.eu/environment/gpp/index\\_en.htm](http://ec.europa.eu/environment/gpp/index_en.htm))
- European Eco-label
- Eco-label Brasileiro Colibri
- Política Brasileira de Resíduos Sólidos (**baseada no pensamento do ciclo de vida**)



- O Programa Brasileiro de Avaliação do Ciclo de Vida
- ACV
- Exemplos de estrutura de coleta e armazenamento de dados



## **Projeto Brasileiro “ICV para a Competitividade da Indústria Brasileira” ICV Brasil**

MCT, IBICT, FINEP, Inmetro, INT, UnB, USP, UTFPr,  
CNI, SEBRAE, Petrobras, ABCV, Abipti, ABNT

Reuniões Preparatórias: de 2004 a 2006  
Início Oficial: Novembro 2006

Coordenação: Instituto Brasileiro para Informação Científica e Tecnológica-IBICT/MCT  
Apoio: MCT

Fim da Primeira Fase: 2010  
Apoio para a 2a. Fase (2010-2012): MCT/MDIC



# Programa Brasileiro de Avaliação do Ciclo de Vida



Serviço Público Federal

MINISTÉRIO DO DESENVOLVIMENTO, INDÚSTRIA E COMÉRCIO EXTERIOR  
CONSELHO NACIONAL DE METROLOGIA, NORMALIZAÇÃO E QUALIDADE INDUSTRIAL – CONMETRO

Resolução nº 04, de 15 de dezembro de 2010

Dispõe sobre a Aprovação do Programa Brasileiro de Avaliação do Ciclo de Vida e dá outras providências

**O CONSELHO NACIONAL DE METROLOGIA, NORMALIZAÇÃO E QUALIDADE INDUSTRIAL – CONMETRO**, usando das atribuições que lhe confere o Art. 3º da Lei nº 5.966, de 11 de dezembro de 1973, e o artigo 2º da Lei nº 9.933, de 20 de dezembro de 1999,

## RESOLVE:

Art. 1º - Aprovar o Programa Brasileiro de Avaliação do Ciclo de Vida (PBACV), em anexo.



# Programa Brasileiro de Avaliação do Ciclo de Vida - Organograma



## PBACV

- Comitê Gestor
- Comitê de Coordenação
  - Comitês Técnicos
    - CT1 – Captação de Recursos
    - CT2 – Inventários
      - Grupos de Trabalho Setoriais: Gestão de Base de Dados; Construção; Metais, Energia Elétrica, Combustíveis, Agropecuária, Plásticos (Química), Eletroeletrônicos (Fim de Vida)
    - CT3 – Avaliação de Impactos Ambientais
    - CT4 – Disseminação
    - CT5 - Capacitação



Resource directory  
Website  
User forum



International Reference Life Cycle Database (ILCD)



## International Reference Life Cycle Data System (ILCD)

ILCD  
Handbook



ILCD  
Data Network

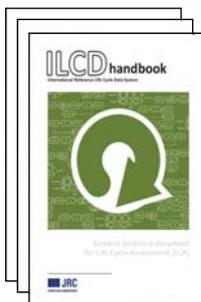


© Ar...



# Objetivos da ILCD

ILCD Handbook



Provide good practice method guidance for LCA in policy and business, in-line with and expanding on the ISO 14040/14044 (no new method developments)

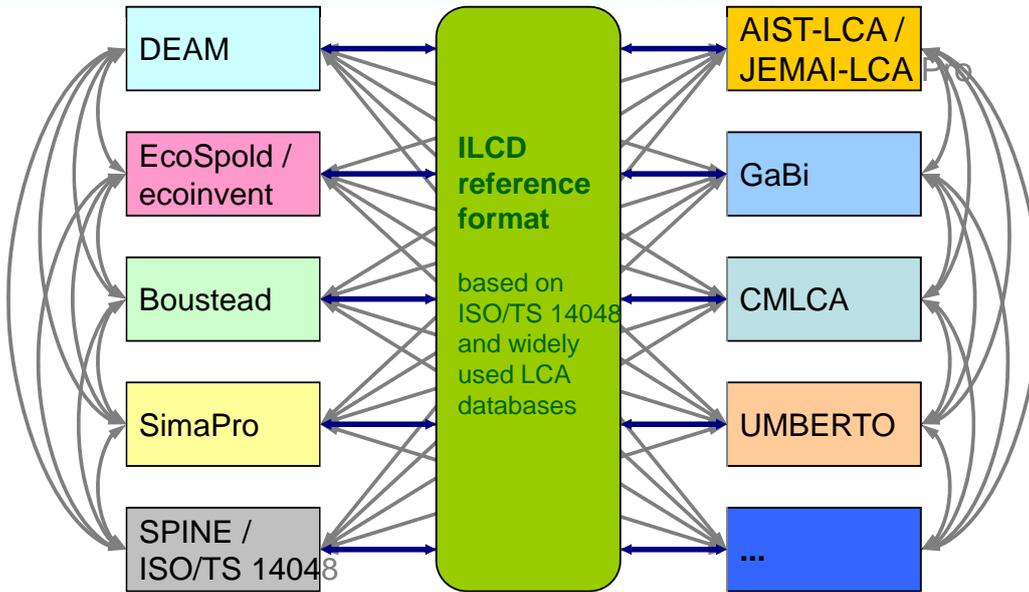
## ILCD Data Network

Provide the infrastructure for better availability of consistent and quality-assured LCA data





# Efficient, complete publication / dissemination and compatible data exchange

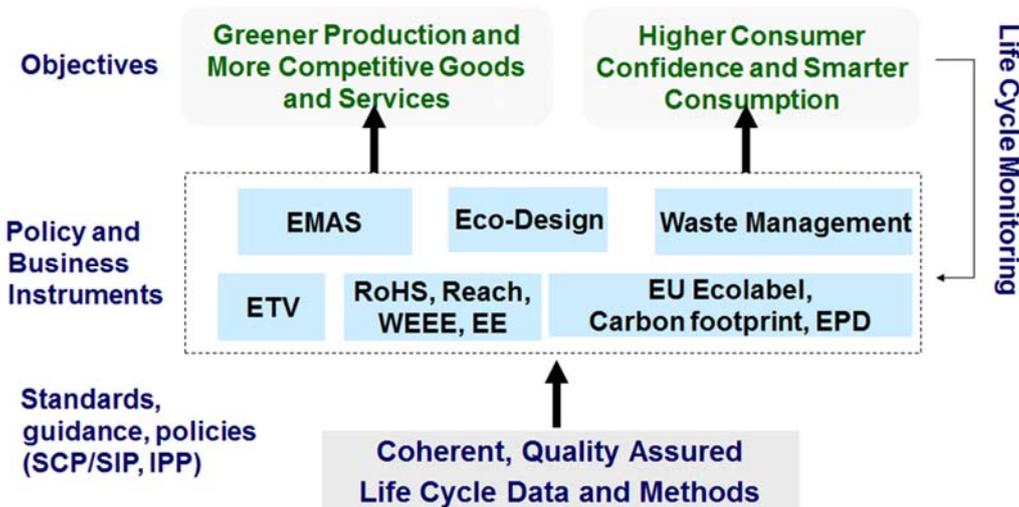


## → Solution: a common reference LCA format

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# International Reference Life Cycle Data System (ILCD) Harmonized Methodology and Format to Support business and policy



European Commission, JRC  
Institute for Environment and Sustainability

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## Frontrunning industries as members of the European Business Advisory Group:



- Alliance for Beverage Cartons and the Environment (ACE)
- Association of Plastics Manufacturers in Europe (PlasticsEurope)
- Confederation of the European Waste-to-Energy Plants (CEWEP)
- European Aluminium Association (EAA)
- European Automobile Manufacturers' Association (ACEA)
- European Cement Association (CEMBUREAU)
- European Copper Institute (ECI)
- European Confederation of Iron and Steel Industries (EUROFER)
- The Voice of the European Gypsum Industry (EUROGYPSUM)
- European Federation of Corrugated Board Manufacturers (FEFCO)
- Industrial Minerals Association Europe (IMA-Europe)
- Lead Development Association International (LDAI)
- Technical Association of the European Natural Gas Industry (MARCOGAZ)
- Sustainable Landfill Foundation (SLF)
- Tiles and Bricks of Europe (TBE)



© Arn



## ILCD in eBalance (China LCA Software)



- Use common ILCD reference elementary flow, flow property, unit group data sets

Select Unit Group through Context Menu

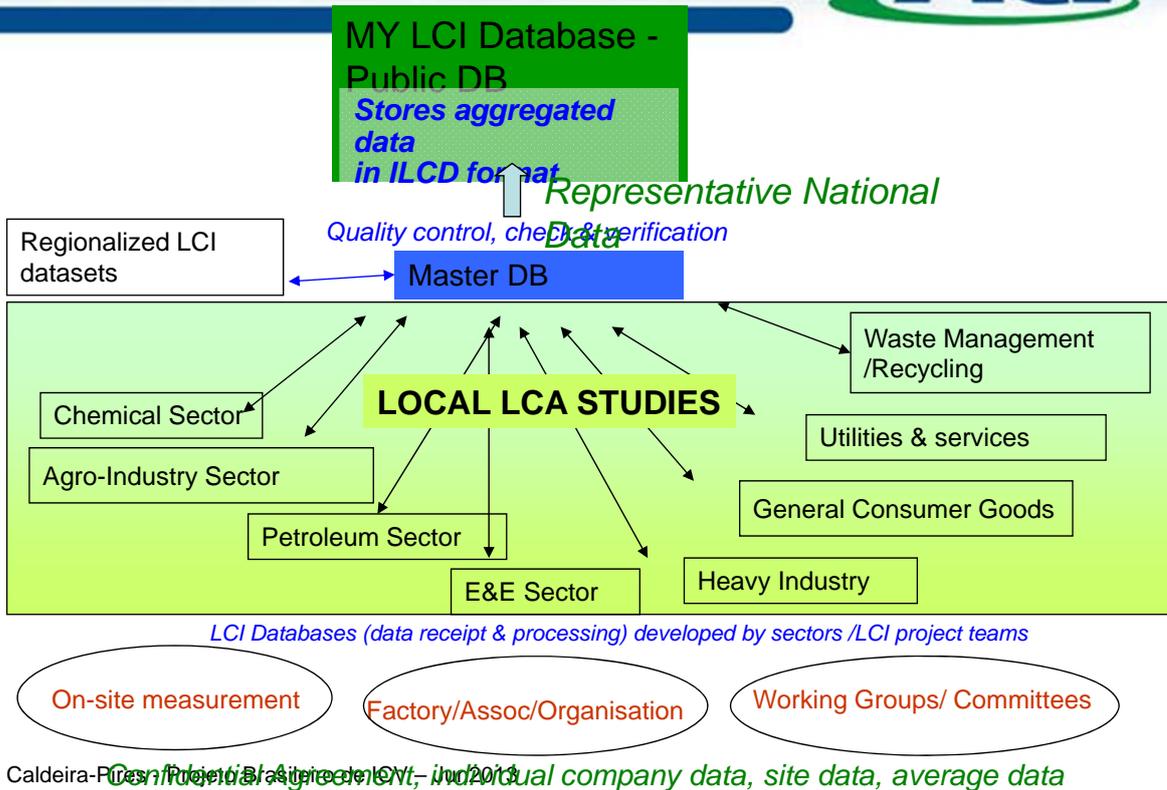
Select unit through DropDownList

Lookup flow by starts with

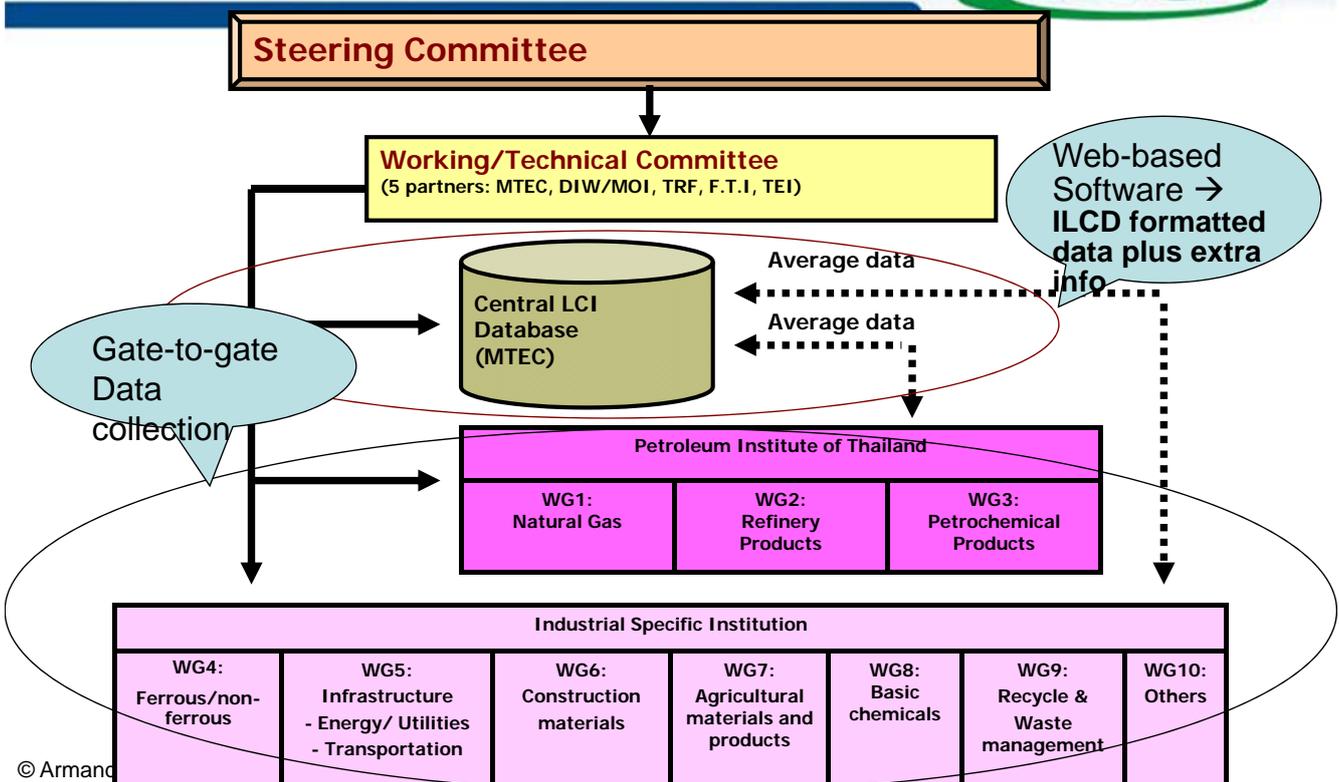
Search flow by classification and keyword



# LCI Database Working Structure for National LCA Project in Malaysia



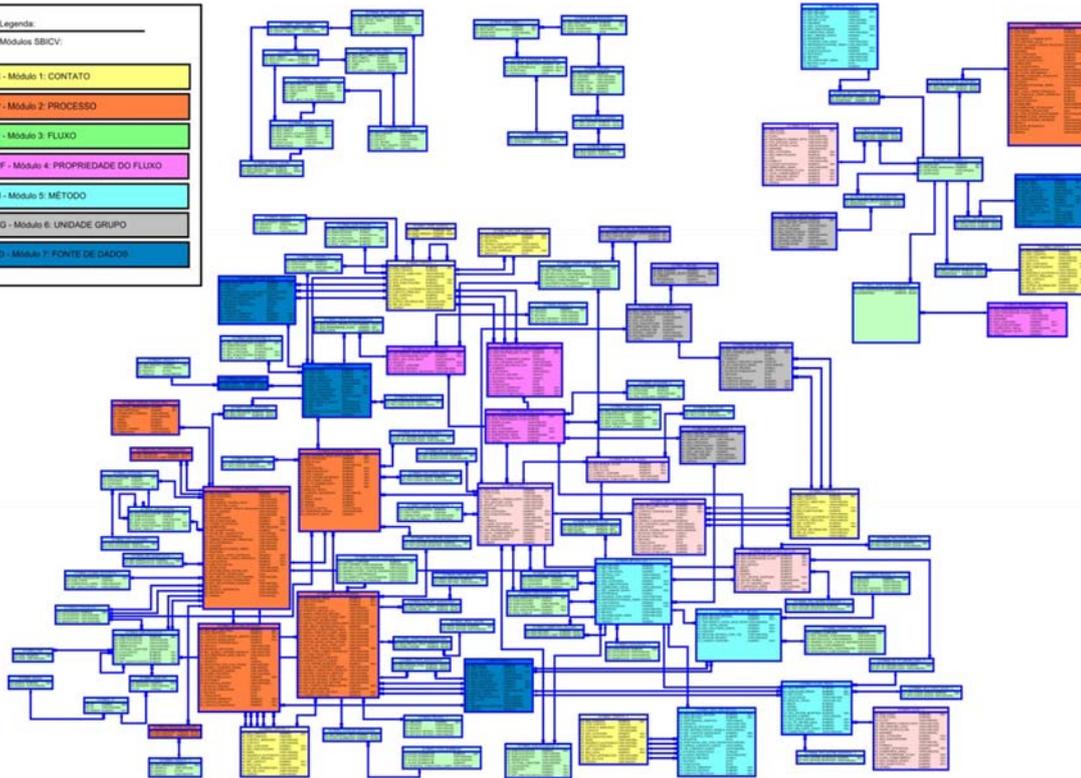
# National Thai LCI Database Operation Structure





# Estrutura de Base de Dados ILCD

SBICV - Modelo de Dados Físico



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# ILCD – Handbook for LCA



## ILCD handbook

International Reference Life Cycle Data System



General guide for Life Cycle Assessment  
- Detailed guidance



20/06/2013

Au...

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ILCD Handbook - General guide for Life Cycle Assessment - Detailed guidance

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# Metodologia Padrão para Elaboração de Inventários de Ciclo de Vida da Indústria Brasileira - Projeto "SICV Brasil – Sistema de Inventários do Ciclo de Vida Brasil"



## Metodologia Padrão para Elaboração de Inventários de Ciclo de Vida da Indústria Brasileira – Documento Consolidado

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- Prof. Armando Caldeira-Pires  
LCI Expert  
(Diesel – Methodology Development)
- Profa. Cassia Ugaya  
LCI Expert  
(Transport - Methodology Application and Test)
- Prof. Gil Anderi da Silva  
LCI Expert  
(Hydro Power - Methodology Application and Test)

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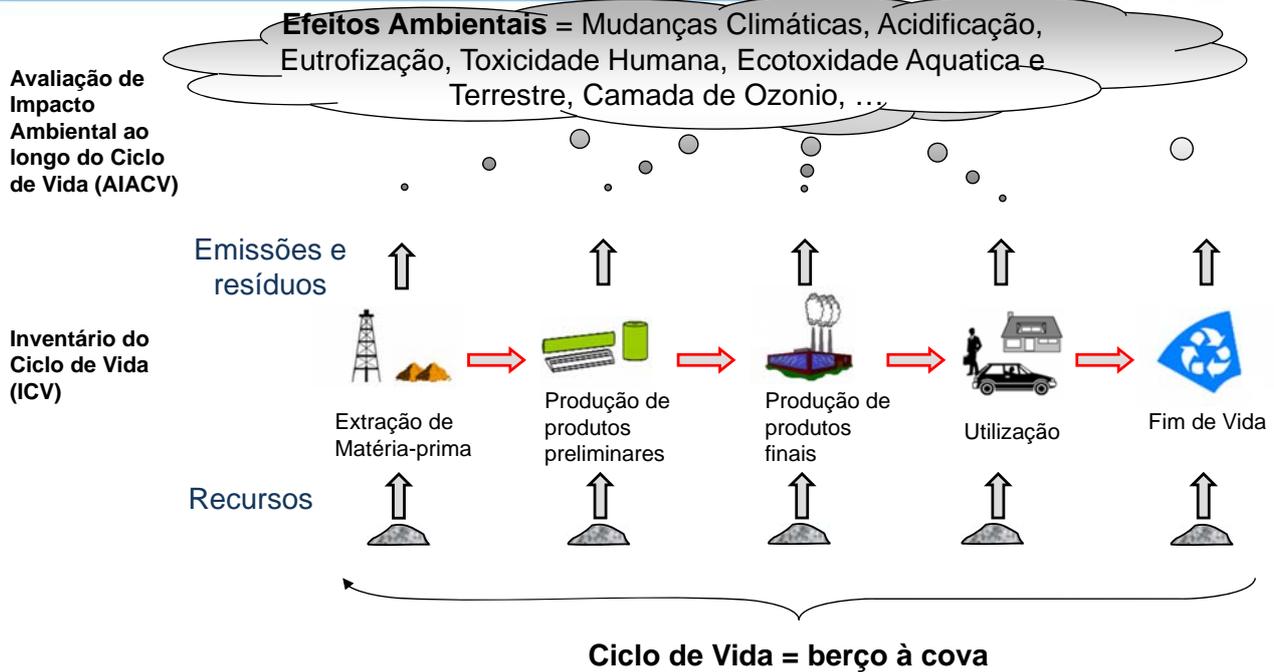
- O Programa Brasileiro de Avaliação do Ciclo de Vida
- ACV
- Exemplos de estrutura de coleta e armazenamento de dados

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# Avaliação do Ciclo de Vida – ACV

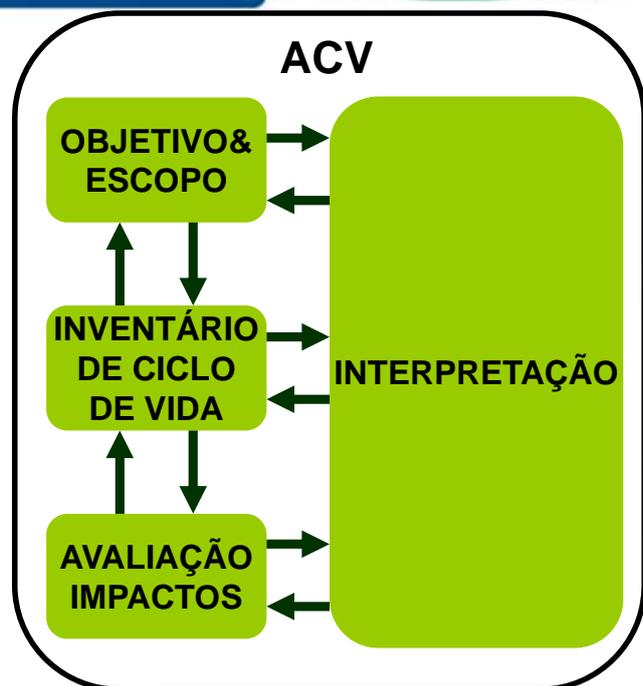
## Estrutura Básica



# Avaliação do Ciclo de Vida – ACV



- ACV
  - Fluxos mássicos e energéticos (*inputs/outputs*);
  - Conversão em categorias de impacto ambiental;
  - Avaliação de Impacto, Normalização, Ponderação, Análise de Sensibilidade





# Questionário de Aquisição de Dados

Microsoft Excel - Questionario AquisicaoDados ICV - Diesel project 2.xls [Modo de Compatibilidade]

**Refinery - Questionaire**

**1.1. Refinery black box - Inputs**

Materials	Description	Value inputs	Reference source and notes
Crude oil	REPLAN's crude oil input: 18.573.651,00m³/year - 16.427.465.627,00 kg Crude oil t/year	16.427.465.627,00	ANP - statistical data [website-2005] / note: 80% of the Crude Oil refined in REPLAN is from national crude oil and 20% is from im
Natural gas	REPLAN's Natural gas input: 156.855,00 t/year - 156.855.000,00 kg/year	156.855.000,00	Via Nam Chan (2007) Quantificação e Predição de Emissões de gases Efeito estufa numa Refinaria de Petróleo - REPLAN, Ma
Water	REPLAN's gross water input: 14.383.920 m³/year - 14.383.920.000 kg/a	14.383.920.000	Roberto da Silva Amorim (2005). Abastecimento de Água de uma refinaria de petróleo. Caso REPLAN. Universidade Federal Flar
Electricity	REPLAN's electricity input: 104.154.141 kWh/year - 374.954.907,6 MWh/year	374.954.907,60	Via Nam Chan (2007) Quantificação e Predição de Emissões de gases Efeito estufa numa Refinaria de Petróleo - REPLAN, Ma

**1.2. Refinery black box - Outputs**

Materials	Description	Value - m³/year	density - kg/m³	Value - kg/year	Reference source
Diesel fuel	REPLAN's diesel output: 9.796.646,00 m³/year	9.796.646,00	852	8.346.742.232	ANP - statistical data [web 2005]
Gasoline	REPLAN's gasoline output: 4.191.920,00 m³/year	4.191.920,00	742	3.104.046.440	ANP - statistical data [web 2005]
Light fuel oil	REPLAN's Heavy and light fuel oil output: 1.167.661,00 m³/year	1.167.661,00	803	938.240.593	ANP - statistical data [web 2005]
Naphtha	REPLAN's Naphtha output: 722.854,00 m³/year	722.854	702	507.443.508	ANP - statistical data [web 2005]
Petrol Coke	REPLAN's Petrol Coke output: 1.351.642,00 m³/year	1.351.642,00	940	1.270.707,20	ANP - statistical data [web 2005]
Propane	REPLAN's Propane output: 1.522,00 m³/day - 555.530,00 m³/year	555.530	520	288.975.600	REPLAN-report 5(2006)
Sulphur	REPLAN's aromatic residues output: 440 m³/day - 166.000,00 m³/year	166.000,00	1090	181.000,00	REPLAN-report 5(2006)
Sulphur (not from Diesel H)	REPLAN's sulphur output: 43.900,000 kg/day - 43.900.000,00 kg/year	43.900.000,00		43.900.000,00	REPLAN-report 5(2006) / note: sulphur as a product of the refinery
CO2	REPLAN's CO2 emission: 2.954.022,00 t/year - 2.954.022.000,00 kg/year	2.954.022.000,00		2.954.022.000,00	Via Nam Chan (2007) Quantificação e Predição de Emissões de gases Efeito estufa numa Refinaria de Petróleo - REPLAN, Ma

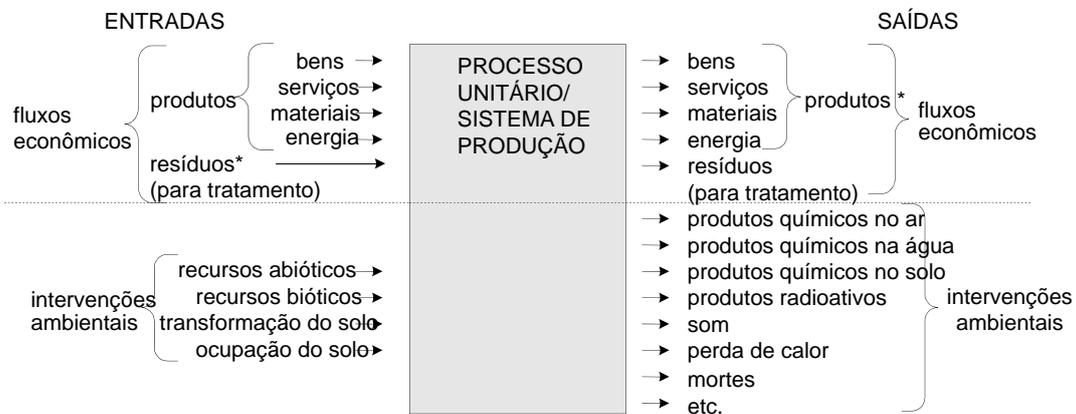
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# Análise de inventário



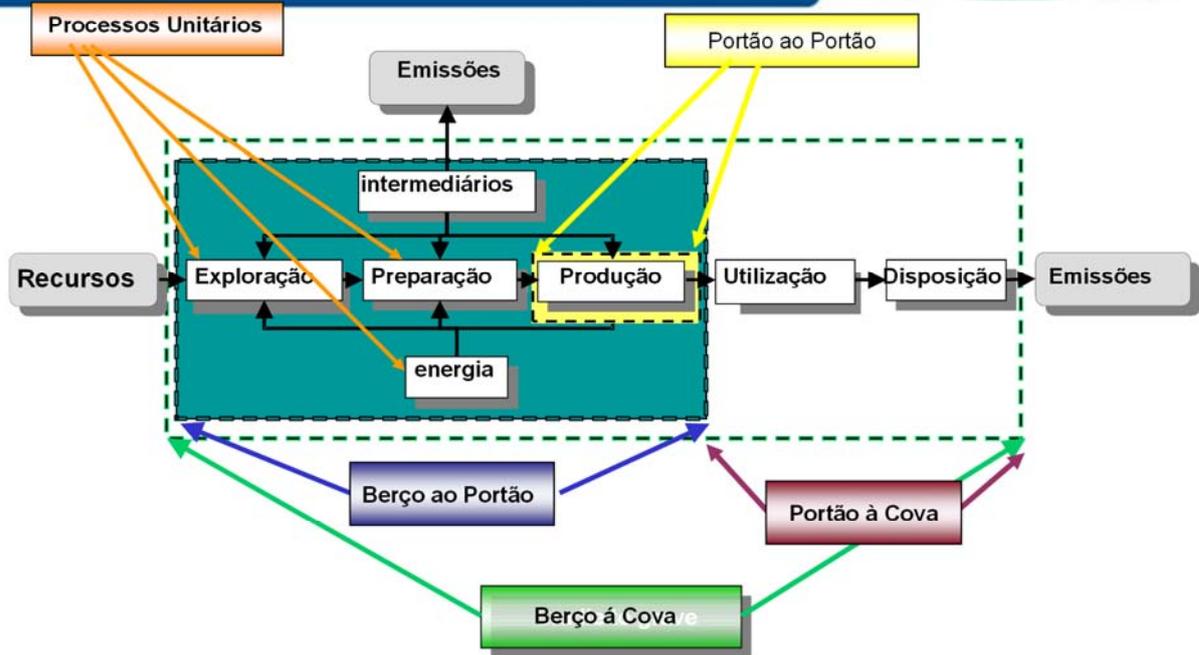
- Detalhamento e quantificação das entradas e saídas relevantes ao(s) sistema(s) do produto sob estudo



\* os fluxos funcionais do processo



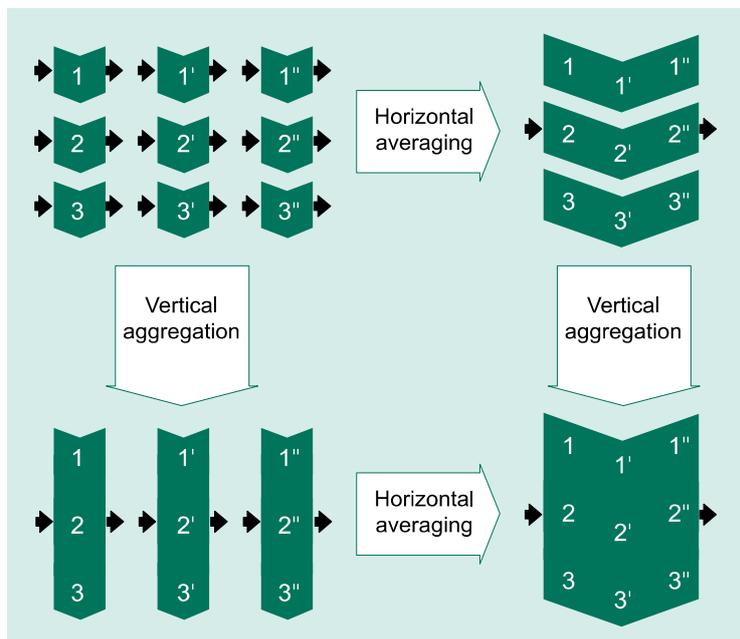
# Avaliação do Ciclo de Vida – ACV – Modelagem do Sistema Tecnológico



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# Processos de Agregação no Desenvolvimento de Inventários



- Agregação Vertical
- Alinhamento Horizontal

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# Exemplo BR:Diesel



## Inventário agrupado no formato ELCD

BR: Diesel: Refinaria Paulínia ELCD/PE-GaBi [Refinery products] -- DB Process

Name: Diesel: Refinaria Paulinia [ELCD/P]

Parameter: LCA | LCC: 0 € | LCWT | Documentation

Year: 2005 | Region: | Meridian: | Latitude: | Allocated: | No image

Completeness: All relevant flows recorded | Comment:

Synonyms:

Inputs							
Flow	Quantity	Amount	Unit	Tracked	Standard	Origin	Comment
Air [Renewable resources]	Mass	0,26807	kg		0 %	(Calculated)	
Barium sulphate [Non renewable resources]	Mass	2,9309E-015	kg		0 %	Literature	
Basalt [Non renewable resources]	Mass	2,0939E-005	kg		0 %	Calculated	
Bauxite [Non renewable resources]	Mass	1,5377E-006	kg		0 %	Calculated	
Bentonite [Non renewable resources]	Mass	0,0010374	kg		0 %	(Literature)	

Outputs							
Flow	Quantity	Amount	Unit	Tracked	Standard	Origin	Comment
1,2-Dibromoethane [Halogenated organic emissions to fresh water]	Mass	2,8127E-015	kg		0 %	Literature	
Acenaphthene [Hydrocarbons to sea water]	Mass	1,1015E-008	kg		0 %	(No statement)	
Acenaphthene [Hydrocarbons to fresh water]	Mass	1,8534E-010	kg		0 %	(No statement)	
Acenaphthylene [Hydrocarbons to sea water]	Mass	4,196E-009	kg		0 %	(No statement)	
Acenaphthylene [Hydrocarbons to fresh water]	Mass	7,8365E-011	kg		0 %	(No statement)	
Acetaldehyde (ethanal) [Group NMVOC to air]	Mass	8,4638E-008	kg		0 %	(Calculated)	
Acetic acid [Group NMVOC to air]	Mass	7,8139E-008	kg		0 %	(Calculated)	
Acetic acid [Hydrocarbons to sea water]	Mass	3,4685E-008	kg		0 %	(No statement)	
Acetic acid [Hydrocarbons to fresh water]	Mass	5,3046E-007	kg		0 %	(No statement)	
Acetone (dimethylcetone) [Group NMVOC to air]	Mass	7,5684E-008	kg		0 %	(Literature)	
Acid (calculated as H+) [Inorganic emissions to fresh water]	Mass	4,7183E-009	kg		0 %	(Literature)	
Acrolein [Group NMVOC to air]	Mass	5,2288E-010	kg		0 %	Literature	
Acrylonitrile [Hydrocarbons to fresh water]	Mass	1,1824E-012	kg		0 %	(No statement)	
Adaptable organic halogen compounds (AOV) [Analytical mass]	Mass	8,3578E-007	kg		0 %	Measured	

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# ICVs Brasileiros

Process or LCI result data set: Gasoline; Gasoline A [Super]; Consumption mix; 200 ppm, at refinery (en)	
Location	BR
Geographical representability description	The data set represents the country specific situation, focusing on the main technologies and the country specific characteristics.
Reference year	2005
Name	Base name: Treatment, standards, rules; Mix type and location; Quantitative product or process properties

Process or LCI result data set: Fuel oil heavy; Consumption mix; at refinery (en)	
Location	BR
Geographical representability description	The data set represents the country specific situation, focusing on the main technologies and the country specific characteristics.
Reference year	2005
Name	Base name: Mix type and location; Quantitative product or process properties Fuel oil heavy; Consumption mix; at refinery

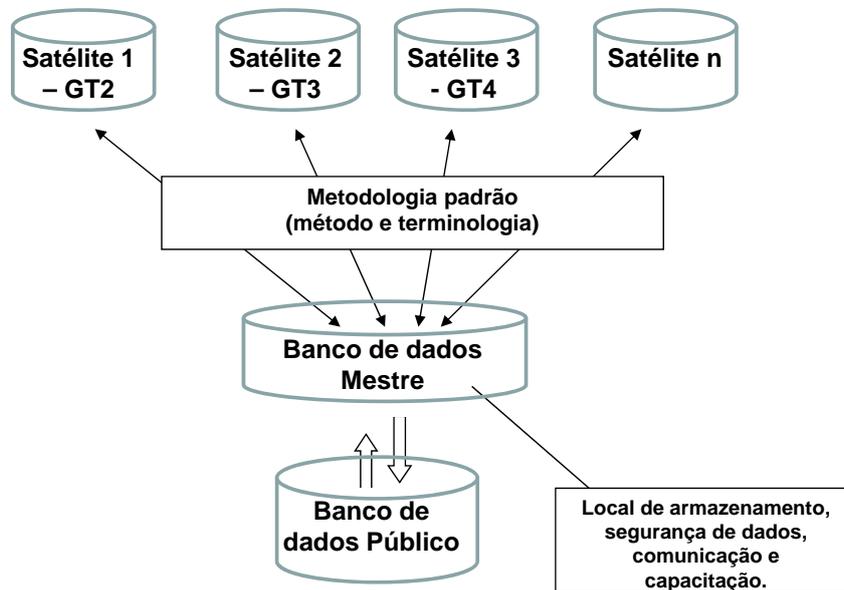
Process or LCI result data set: Naphtha; Consumption mix; at refinery (en)	
Location	BR
Geographical representability description	The data set represents the country specific situation, focusing on the main technologies and the country specific characteristics.
Reference year	2005
Name	Base name: Quantitative product or process properties Petrol coke ; at refinery

Process or LCI result data set: Kerosene ; Consumption mix; 2000 ppm sulphur, at refinery (en)	
Location	BR
Geographical representability description	The data set represents the country specific situation, focusing on the main technologies and the country specific characteristics.
Reference year	2005
Name	Base name: Mix type and location; Quantitative product or process properties Kerosene ; Consumption mix; 2000 ppm sulphur, at refinery

Process or LCI result data set: Diesel ; Consumption mix; 500 ppm sulphur, at refinery (en)	
Location	BR
Geographical representability description	The data set represents the country specific situation, focusing on the main technologies and the country specific characteristics.
Reference year	2005
Name	Base name: Mix type and location; Quantitative product or process properties Diesel ; Consumption mix; 500 ppm sulphur, at refinery



# Estrutura da Base de Inventários do PBACV



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CML2001, Experts IKP (Southern Europe) [Evaluation] -- Weighting

Quantity	Equivalences	Unit	Standard	Weights
CML2001, Abiotic Depletion (ADP)	0,66667	kg Sb-Eq.0 %	1,5	
CML2001, Acidification Potential (AP)	1	kg SO2-E.0 %	1	
CML2001, Eutrophication Potential (EP)	0,14286	kg Phosfol.0 %	7	
CML2001, Global Warming Potential (GWP 100 years)	0,1	kg CO2-E.0 %	10	
CML2001, Ozone Layer Depletion Potential (ODP, st0,5)	0,5	kg R11-E.0 %	2	
CML2001, Photochem. Ozone Creation Potential (PCO,33333)	0,33333	kg Ethene.0 %	3	
CML2001, Radioactive Radiation (RAD)	2	DALY	0 %	0,5

Username: changed PE-GaBi 20 Last changes: <User>, 1.1.96 0:00:00

EDIP 2003, Env. imp. eval. (PET W, EU 2004) [Evaluation] -- Weighting

Quantity	Equivalences	Unit	Standard	Weights
EDIP 2003, Acidification potential	0,7874	m2 UES	0 %	1,27
EDIP 2003, Aquatic eutrophication	0,81967	kg NO3-E.0 %	1,22	
EDIP 2003, Global warming	0,89286	kg CO2-E.0 %	1,12	
EDIP 2003, Photochemical ozone formation - impact	0,75188	pers*ppm.0 %	1,33	
EDIP 2003, Photochemical ozone formation - impact	0,75188	m2 UES.0 %	1,33	
EDIP 2003, Stratospheric ozone depletion	0,015873	kg R11-E.0 %	63	
EDIP 2003, Terrestrial eutrophication	0,81967	m2 UES	0 %	1,22

Username: changed PE-GaBi 20 Last changes: <User>, 1.1.96 0:00:00

EI99, HA (Hierarchist approach) [Evaluation] -- Weighting

Quantity	Equivalences	Unit	Standard	Weights
EI99, HA, Ecosystem quality, Acidification/nutricat	0,03424	PDF*m2.0 %	29,206	
EI99, HA, Ecosystem quality, Ecotoxicity	0,015832	PDF*m2.0 %	63,162	
EI99, HA, Ecosystem quality, Land conversion	0,0032506	PDF*m2	0 %	307,63
EI99, HA, Ecosystem quality, Land-use	0,0032506	PDF*m2.0 %	307,63	
EI99, HA, Human health, Carcinogenic effects	0,019255	DALY	0 %	51,934
EI99, HA, Human health, Climate Change	0,016113	DALY	0 %	62,061
EI99, HA, Human health, Ozone layer depletion	0,17585	DALY	0 %	5,6868
EI99, HA, Human health, Radiation	1,437	DALY	0 %	0,69591
EI99, HA, Human health, Respiratory (inorganic)	0,0035991	DALY	0 %	277,85
EI99, HA, Human health, Respiratory (organic)	0,56302	DALY	0 %	1,7761
EI99, HA, Resources, Fossil fuels	0,0050896	MJ surplu	0 %	196,48
EI99, HA, Resources, Minerals	0,28405	MJ surplu	0 %	3,5205

Username: changed PE-GaBi 20 Last changes: <User>, 1.1.96 0:00:00

## Avaliação de Impacto Ambiental

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## Gases de Efeito Estufa



Trace Gas	GWP	Trace Gas	GWP
Carbon Dioxide	1	HFC-143a	3800
CCI 4	1300	HFC-152a	140
CFC- 11	3400	HFC-227ea	2900
CFC-113	4500	HFC-23	9800
CFC-116	>6200	HFC-236fa	6300
CFC-12	7100	HFC-245ca	560
CFC-I 14	7000	HFC-32	650
CFC-I 15	7000	HFC-41	150
Chloroform	4	HFC-43-IOmee	1,300
HCFC- 123	90	Methane	21
HCFC- 124	430	Methylenechloride	9
HCFC-141b	580	Nitrous Oxide	310
HCFC-142b	1600	Perfluorobutane	7000
HCFC-22	1600	Perfluorocyclobutane	8700
HFC- 125	2800	Perfluoroethane	9200
HFC-134	1,000	Sulphur hexafluoride	23900
HFC-134a	1300	Trifluoriodomethane	<1
HFC-143	300		

Adaptado de Thomas, C., Tennant, T. and Rolls, J., 2000, "The GHG Indicator: UNEP Guidelines for Calculating Green house Gas Emissions for Businesses and Non-Commercial Organisation", UNEP, Suíça

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- O Programa Brasileiro de Avaliação do Ciclo de Vida
- ACV
- Categorias Ambientais de Produtos e as Declarações Ambientais de Produtos – EPD
- Exemplos de estrutura de coleta e armazenamento de dados

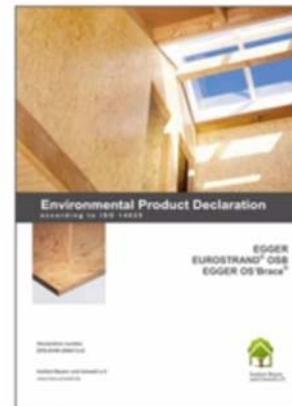
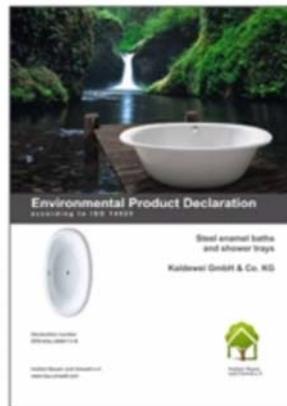


## O que são as Declarações Ambientais de Produtos?



### Declarações Ambientais de Produtos – EPD

- A declaração inclui a documentação sobre o produto, seu ciclo de vida, a pegada ecológica, bem como os resultados da avaliação das emissões;
- Os dados do fabricante são verificados de forma independente;
- Procedimentos e fundamentos estabelecidos pelas Regras de Categorias de Produtos (Product Category Rules – PCR)



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## Quais são os benefícios do EPD?



### Internos:

- Maior transparência nos processos e informações dos fluxos de energia e materiais;
- Identificação de potenciais otimizações ;
- Classificação do desempenho ambiental dos produtos considerando-se a competitividade;
- Possibilidade da criação de um modelo parametrizado (i-report);
- Impactos dos produtos no resultado final das construções.

### Externas:

- Instrumento de marketing e de vantagens competitivas;
- Demonstração de consciência ambiental pelos membros da IBU em suas companhias;
- Vantagens para a ACV de edificações e certificações;
- Dados disponíveis para a certificação (Okobau.dat).

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## Bases Legais para EPDs



### A regulação dos produtos da construção (CPD):

- **Diretiva 89/106/EEC:** regula a inserção de produtos da construção desde 1989. Em 1992, as diretivas dos produtos da construção (CPD) juntamente com os atos dos produtos da construção (BauPG) são inseridos na legislação alemã;
- **6 requerimentos essenciais:** resiliência e estabilidade mecânica; prevenção contra incêndio; higiene, meio ambiente e saúde; segurança no período de uso; prevenção de ruídos; eficiência energética e isolamento térmico;
- Requerimentos que devem ser apresentados em dois formatos: normas europeias harmonizadas (hEN) ou Aprovação Técnica Europeia (ETA) – aptidão quanto ao uso do produto.



## Bases Legais para EPDs – Nova Abordagem



- Objetivo de criar um mercado comum europeu, no qual elimina-se as barreiras técnicas. Princípio da harmonização das legislações nacionais para um número limitado de requisitos essenciais;



### Regulações de produtos da construção (Construction Product Regulation – CPR)

- CPR substitui as diretivas de produtos da construção (CPD);
- Provê uma “linguagem técnica comum”;
- Uniformidade nos métodos de avaliação de performance dos produtos da construção;
- Define-se requisitos básicos para os produtos da construção. Exemplo: **Requirimentos básicos nº 7: Sustentabilidade no uso dos recursos naturais**





# Interação entre CPD e EPD



## A nova abordagem:

- CEN/TC 350: “Desenvolvimento horizontal de métodos padronizados para a avaliação do desempenho ambiental integrado dos edifícios”.
- ACV única e EPDs para cada região – resultados únicos para toda a Europa;
- O ciclo de vida de um produto (produção a disposição/reciclagem) será considerado com mais detalhes;
- Avaliação só é possível no contexto dos produtos aplicados ao edifício.

CEN/TC350 - Current Work Programme

Framework level	prEN 15643-1 Sustainability Assessment of Buildings - General Framework (2012)				
	prEN 15643-2 Framework for Environmental Performance (2012)	prEN 15643-3 Framework for Social Performance (2012)	prEN 15643-4 Framework for Economic Performance (2012)	Technical Characteristics	Functionality
	Framework for Methods of Assessment of Environmental Performance (2012)			Service Life Prediction - General Principles (2012)	
Building level	prEN 15678 Assess. of Environ. Performance (2012)	Preliminary WI Assessment of Social Performance - Methods (2012)	Assessment of Economic Performance (2012)	CEN Standards on Energy Performance of Buildings Directive (EPBD)	
	WI 003 Use of EPDs (2012)		Life Cycle Costing (2012)		
Product level	prEN 15804 Environmental Product Declarations (2012)	(?)	(?)	Service Life Prediction (2012), Feedback from Practice (2012-2), Reference Service Life (2012)	
	EPD of Build. Products (2012)				
	prEN 15842 Comm. Format B-to-B (2012)				
	prCEN/TR 15841 Generic B2B (2012)				



# Sistemas de EPDs no Setor da Construção





## Esquemas de EPDs para Construção



Indicadores	IBU	Perfis ambientais	FDES	MRPI	CEN TC 350	ELCD
Mudança climática	S	S	S	S	S	Inventário
Acidificação	S	S	S	S	S	Inventário
Eutrofização	S	S	S	S	S	Inventário
POCP	S	S	S	S	S	Inventário
Depleção do ozônio	S	S	S	S	S	Inventário
Depleção abiótica	Alguns	N	S	S	N	Inventário
Ecotoxicidade e humana	N	S	S	S	N	Inventário
Energia	N	S	S	S	S	Inventário
Água	N	S	S	N	S	Inventário
Resíduos	N	S	S	S	S	Inventário
Resíduos nuclear	N	S	N	N	N	Inventário

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## Esquemas de EPDs para Construção



Indicadores	IBU	Perfis ambientais	FDES	MRPI	CEN TC 350	ELCD
<b>Mudança climática</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>Inventário</b>
<b>Acidificação</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>Inventário</b>
<b>Eutrofização</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>Inventário</b>
<b>POCP</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>Inventário</b>
<b>Depleção do ozônio</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>Inventário</b>
Depleção abiótica	Alguns	N	S	S	N	Inventário
Ecotoxicidade e humana	N	S	S	S	N	Inventário
Energia	N	S	S	S	S	Inventário
Água	N	S	S	N	S	Inventário
Resíduos	N	S	S	S	S	Inventário
Resíduos nuclear	N	S	N	N	N	Inventário

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**Product Category Rules for Type III  
environmental product declaration  
of construction products to EN  
15804:2012**

**FINAL VERSION**



Table 7.2: Parameters for describing environmental impacts

Impact Category	Parameter	Unit
Global Warming (Climate Change)	Global warming potential, GWP	kg CO <sub>2</sub> eq., 100 years
Ozone Depletion	Depletion potential of the stratospheric ozone layer, ODP	kg CFC 11 eq.
Acidification for Soil and water	Acidification potential of soil and water, AP	kg SO <sub>2</sub> eq.
Eutrophication	Eutrophication potential, EP	kg (PO <sub>4</sub> ) <sup>3-</sup> eq.
Photochemical Ozone Creation	Formation potential of tropospheric ozone, POCP	kg C <sub>2</sub> H <sub>4</sub> eq.
Depletion of Abiotic Resources – elements	Abiotic depletion potential for non-fossil resources, ADP-elements	kg Sb eq.
Depletion of Abiotic Resources – fossil fuels	Abiotic depletion potential for fossil resources, ADP-fossil fuels	MJ, net calorific value

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# Exemplo atual: Anicer



O QUE É?  
PORQUE ACV DE PRODUTOS CERÂMICOS?  
RESULTADOS DA AVALIAÇÃO DO CICLO DE VIDA  
CONCLUSÕES DO ESTUDO



Produtos cerâmicos são a solução mais sustentável para construções, de acordo com estudo inédito no Brasil.



# Exemplo atual: World Steel Association



CO<sub>2</sub> EMISSIONS DATA COLLECTOR  
User Guide, Ver 1.0



## Appendix 5: List of participating companies

The following companies contributed to the LCI released in February 2010.

- ArcelorMittal
- Baosteel
- CELSA
- Gerdau
- JFE
- JSW
- Kobe Steel
- Nippon Steel
- Nisshin
- Ruukki
- SAIL
- SSAB
- Sumitomometal
- Tata Steel Europe
- ThyssenKrupp Steel
- voestalpine





## Capacitação e Disseminação do PBACV

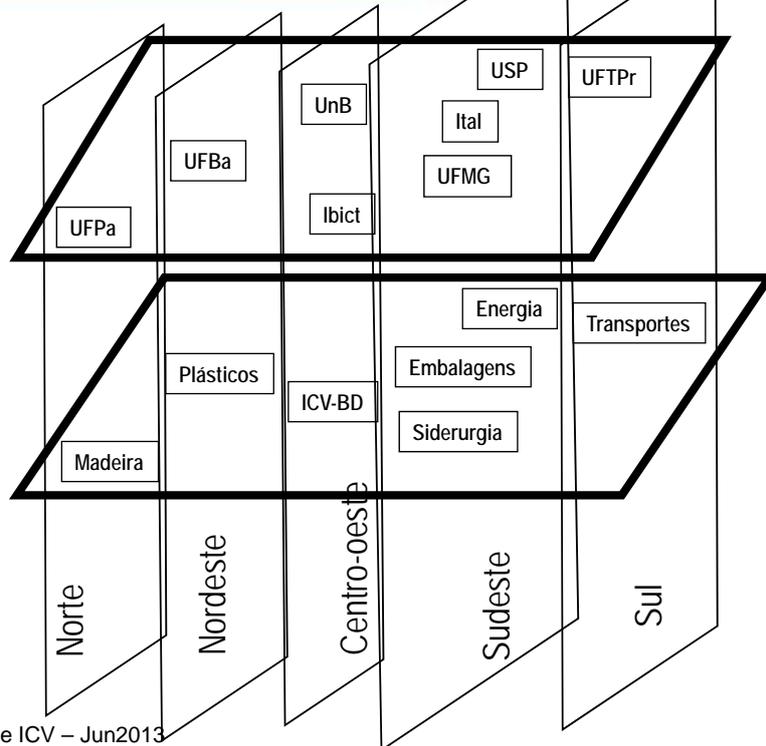


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## Programa Brasileiro de Avaliação do Ciclo de Vida-PBACV

# OBRIGADO

Armando Caldeira-Pires  
Coordenador do CT2-Inventários/PBACV (Prof. UnB)

OFICINA 02: GT CONSTRUÇÃO/CT2/PBACV

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