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# ENERGIA Y ARQUITECTURA

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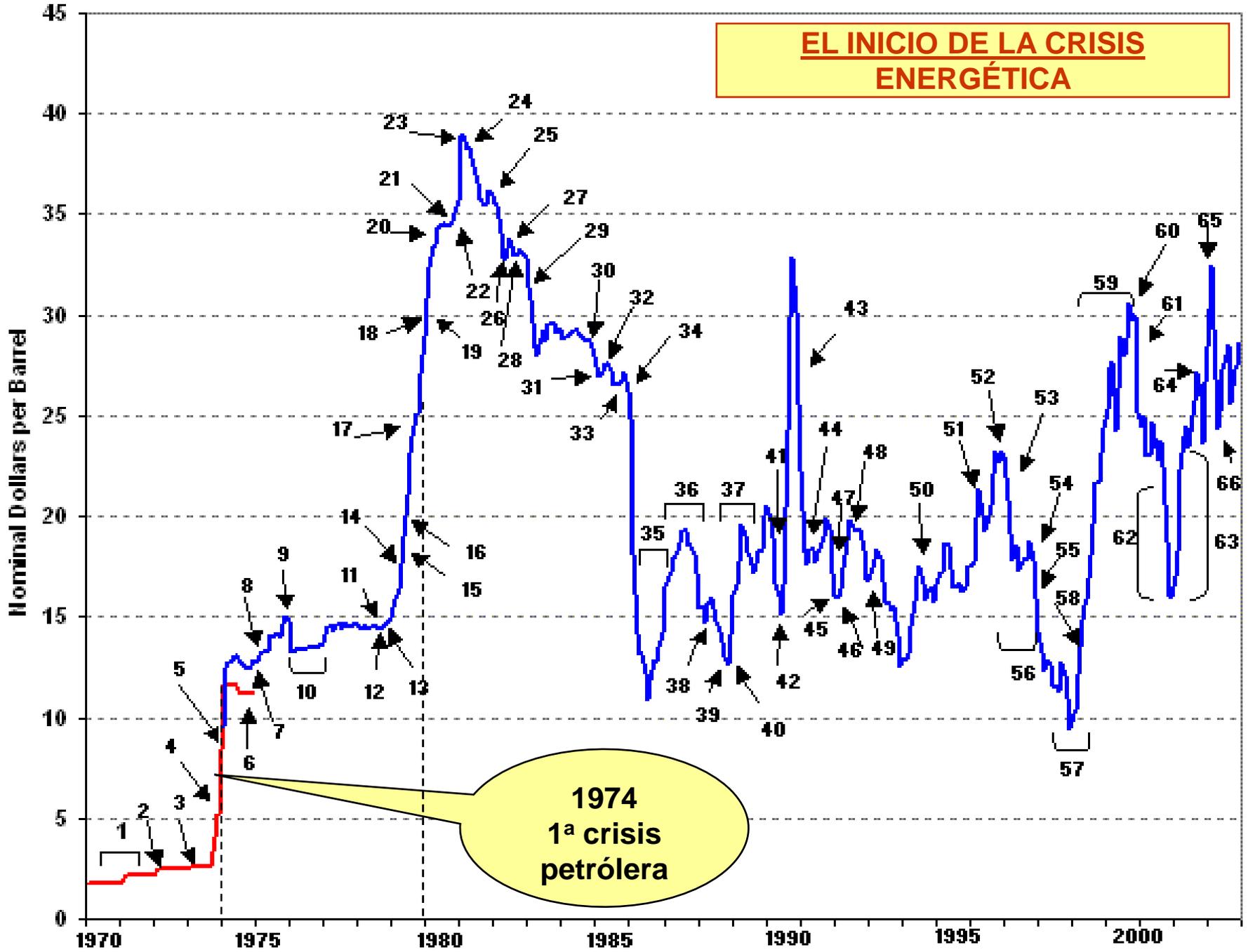
Prof. Dra. LÚCIA PIRRÓ

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# EL INICIO

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# EL INICIO DE LA CRISIS ENERGÉTICA



1974  
1ª crisis petrolera

Official Price of Saudi Light

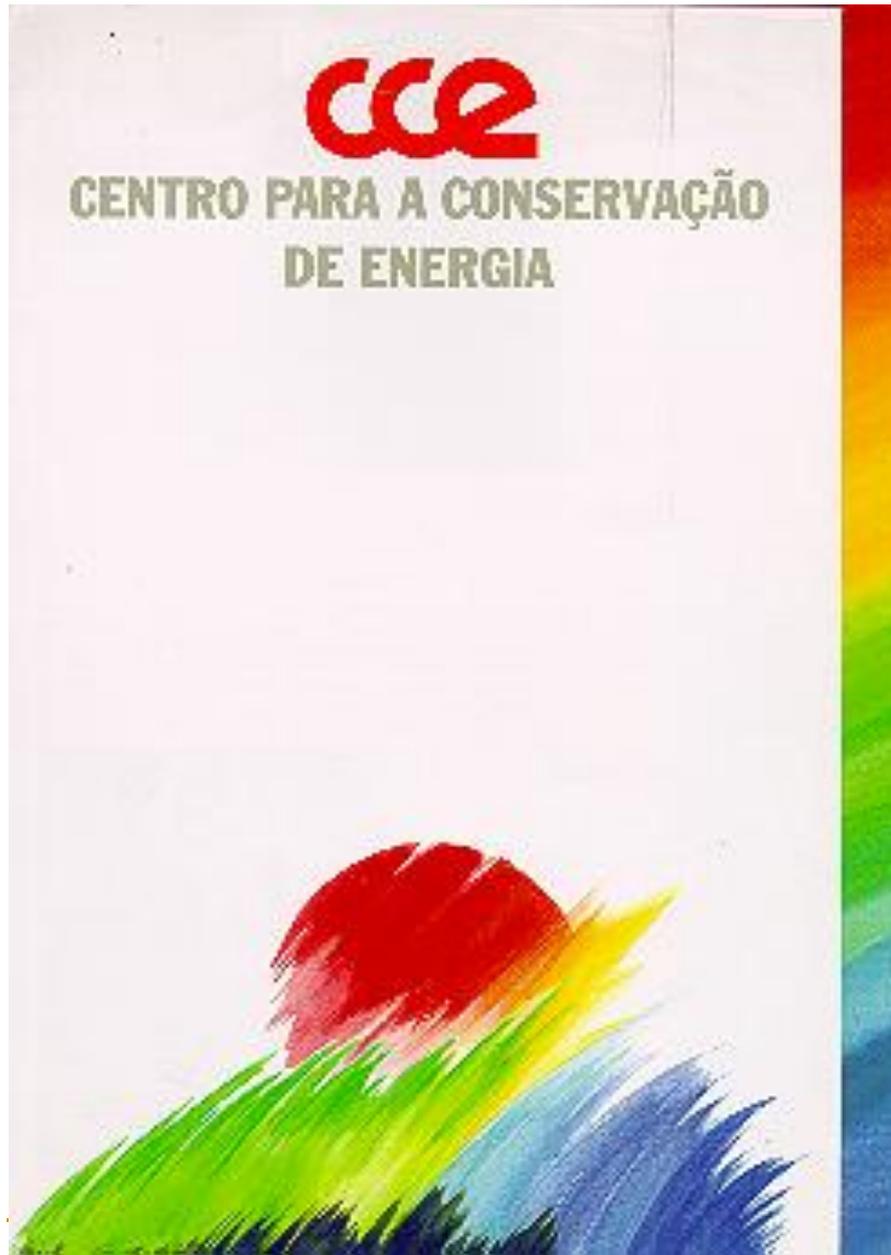
Refiner Acquisition Cost of Imported Crude Oil

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# LAS RECOMENDACIONES Y EL PROCESO NORMATIVO

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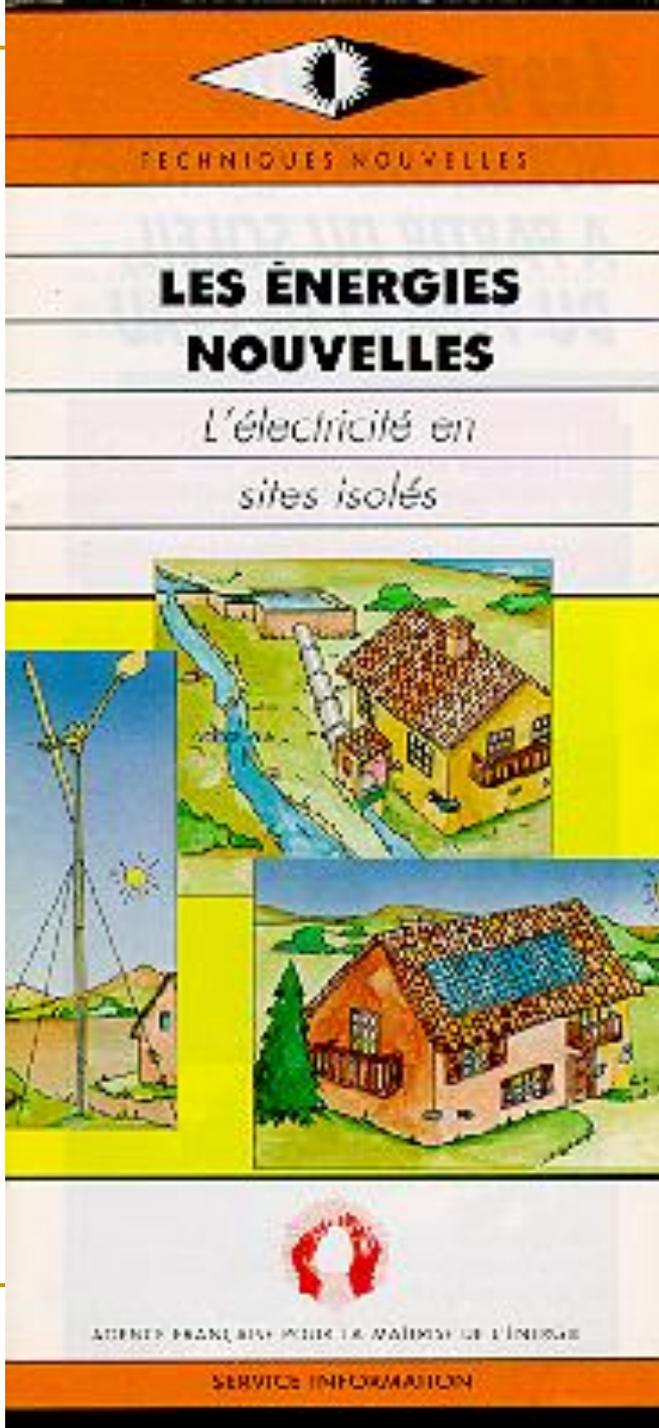
## LA ETAPA PRE-REGULACIÓN



# RECOMENDACIONES DE EFICIENCIA ENERGÉTICA EN LOS EDIFÍCIOS

## PRE-REGULACIÓN

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# RECOMENDACIONES DE EFICIENCIA ENERGÉTICA EN LOS EDIFICIOS

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**FRANCIA**

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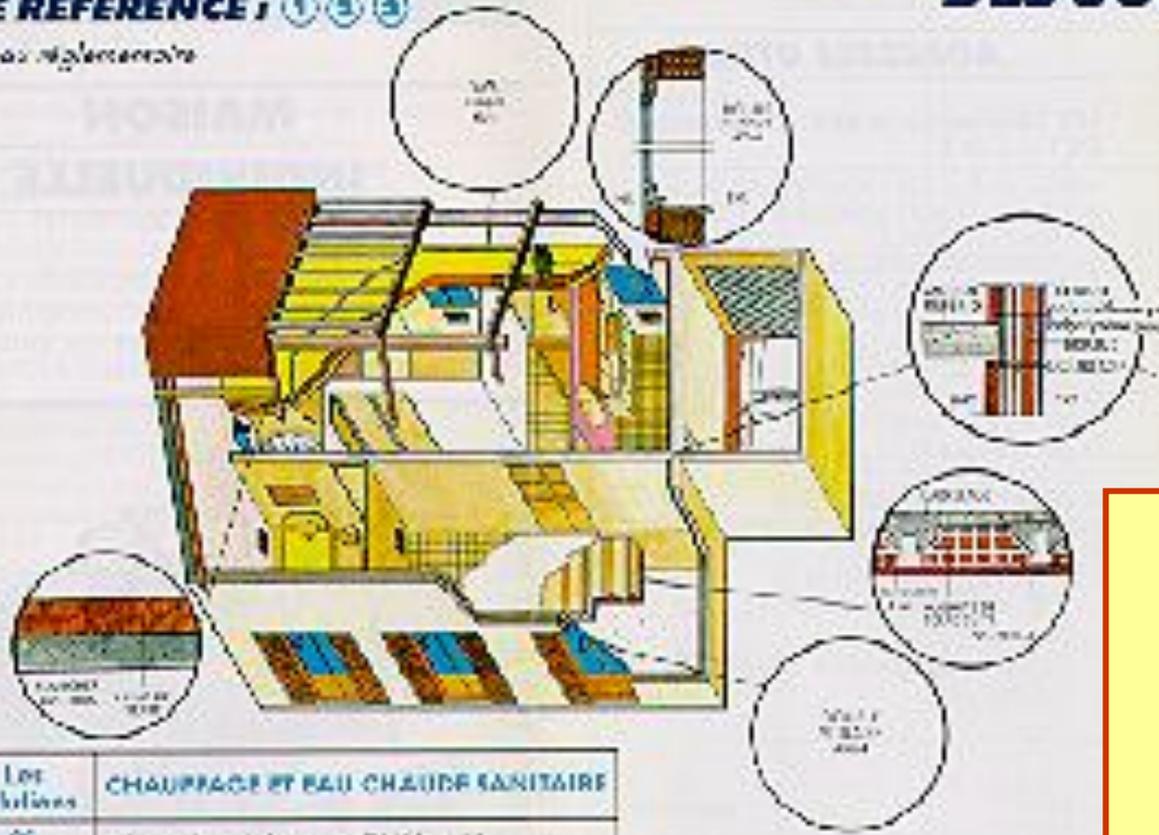
# LAS RECOMENDACIONES Y LAS REGLAS EVOLUCIONAN A REGLAMENTOS

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**LES SOLUTIONS DE REFERENCE** ① ② ③

Chaque réglementation

**DESCRIPTIF DES SOLS**



Les solutions	CHAUFFAGE ET EAU CHAUDE SANITAIRE
① Eclairage idéologique	<ul style="list-style-type: none"> <li>• Construction des locaux pour le chauffage</li> <li>• Chauffage central par radiateurs à eau chaude</li> </ul>
② Système géo	<ul style="list-style-type: none"> <li>• Chauffage central par radiateurs à eau chaude</li> <li>• Chauffage central par radiateurs à eau chaude</li> <li>• Régulation centrale en chauffage. Distribution centralisée.</li> </ul>
③ Affaires En	<ul style="list-style-type: none"> <li>• Chauffage central par radiateurs à eau chaude</li> </ul>

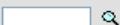
Rég.	Épaisseur en		
	①	②	③
H1	0	5	5
H2	7	5	5
H3	5	5	5

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REGLAMENTACIÓN DETALLADA



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Decreto-Lei N.º 40/90 de 06-02-1990

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[Artigo 1º](#) - Objecto.

[Artigo 2º](#) - Âmbito de aplicação.

**Capitulo II** - Princípios gerais, definições e referências

[Artigo 3º](#) - Índices e parâmetros de caracterização.

[Artigo 4º](#) - Definições e referências.

**Capitulo III** - Requisitos energéticos

[Artigo 5º](#) - Limitação das necessidades nominais de aquecimento.

[Artigo 6º](#) - Limitação das necessidades nominais de arrefecimento.

[Artigo 7º](#) - Requisitos mínimos de qualidade térmica dos edificios.

**Capitulo IV** - Licenciamento, fiscalização e sanções.

[Artigo 8º](#) - Licenciamento.

[Artigo 9º](#) - Fiscalização.

Anexos: [I](#) - [II](#) - [III](#) - [IV](#) - [V](#) - [VI](#)

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# RESULTADOS DE CONSERVACION DE ENERGIA OBTENIDOS POR MEDIO DE PROGRAMAS DE INVESTIGACIÓN Y DESSARROLLO EUA - 1978-1997 - US\$ MILES DE MILLONES



Fuente: Rosenfeld, DOE/USA



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agenda internaci

cplp

## Meio Ambiente - Rio-92

Conferência das Nações Unidas sobre Meio Ambiente e Desenvolvimento

**1992**  
**EL TEMA AMBIENTAL ES**  
**TRATADO POR LAS**  
**POLITICAS PÚBLICAS Y**  
**POLITICAS DE**  
**GOBIERNO**

de do Rio de Janeiro foi a sede da Conferência das Nações Unidas sobre Meio Ambiente e Desenvolvimento (CNUDM), realizada de 3 a 14 de junho de 1992, conhecida como Rio-92, e a ela participaram representantes de 175 países. Foi, ainda, o primeiro evento de magnitude a se realizar no Brasil com o meio ambiente já começara 20 anos antes, quando o País participou da Conferência das Nações Unidas sobre o Meio Ambiente Humano, realizada em Estocolmo, em 1972, em especial no seu período preparatório de dois anos, quando a Conferência contou com ativa contribuição brasileira no sentido de introduzir, de modo inseparável, a temática do desenvolvimento no contexto mais amplo das questões do meio ambiente. Esse marco inicial dos esforços internacionais para a proteção do meio ambiente viu-se prejudicado, contudo, por ter ocorrido num momento

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Capa

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The **building sector** accounts for ...

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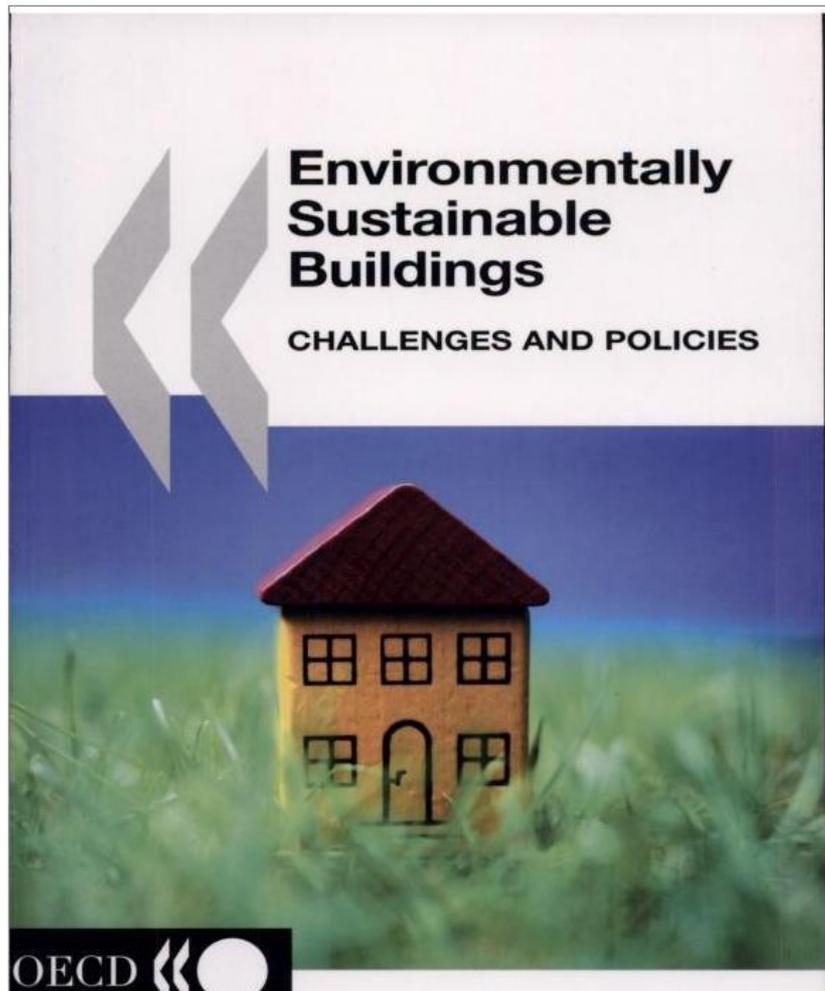
**Energy consumption** in the **building** ...

[Página 21](#)

**Energy consumption** in the **building** ...

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**Energy consumption** in the **building** ...



**EDIFÍCIOS**

**SURGE EL TEMA DE SUSTENTABILIDAD RELACIONADA CON LA EFICIENCIA ENERGÉTICA EN EL SECTOR DE EDIFÍCIOS**

# EL CONCEPTO DE SUSTENTABILIDADE EN LA ARQUITECTURA

Environmentally Sustainable Buildings... - Pesquisa de Livros do Google - Microsoft Internet Explorer

Arquivo Editar Exibir Favoritos Ferramentas Ajuda

Endereço: <http://books.google.com/books?vid=ISBN9264196253&id=BJFY7p7D9yMC&pg=PP1&pg=PA7&dq=energy+consumption+on+building+sector>

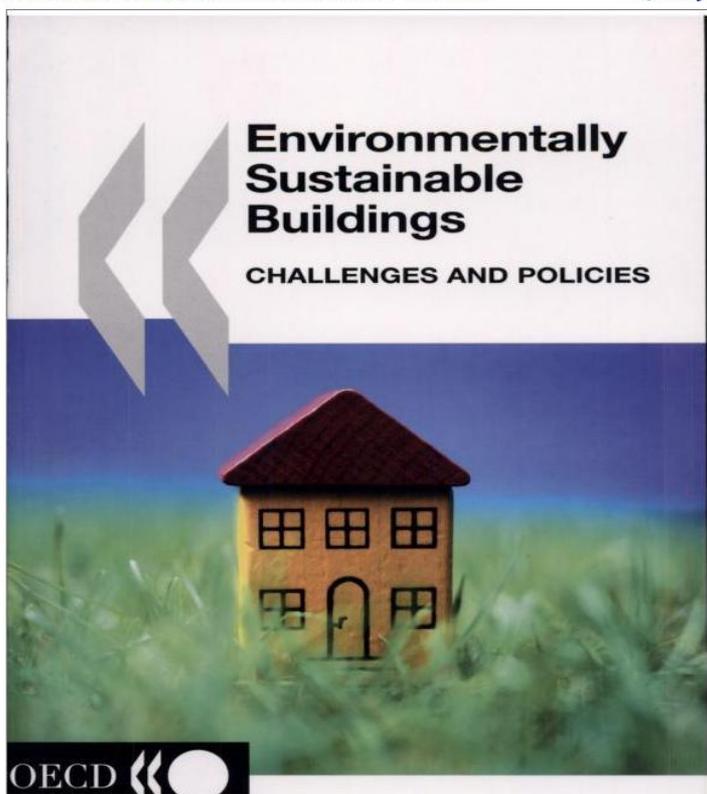
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energy consumption on building sector

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- Extrapola a edifícios
- Incorpora a ciudades
- Pretende reducir los impactos ambientales
  - Producción de materiales
  - Transporte de materiales
  - Uso, operación y mantención
  - Generación y Tratamiento de residuos
- Pretende una mejor calidad de ambiente interno de los edificios
- Pretende la reducción de los consumos en los edificios
  - Energia eléctrica
  - Gás
  - Água
  - Materiales de construcción

breeam



En su currículum, BREEAM tiene un premio de “mejor programa” en la “Tokyo World Sustainable Conference” de 2005, mas de 65 mil edificios certificados en el Reino Unido e 270 mil procesos en funcionamiento.



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USGBC is a community of leaders working to transform the way buildings and communities are designed, built and operated. We envision an environmentally responsible, healthy, and prosperous environment that improves the quality of life.

## What's LEED?

LEED Green Building Rating System is the national benchmark for high performance green buildings. [Learn More...](#)

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- What's New
- Membership
- LEED News
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- Chapters

## What's New

### GSA Says LEED "Most Credible" System

The U.S. General Services Administration (GSA) has issued a report stating... [Read More...](#)

### Commitment

Communities



1993

SÉ CREA EL CONSEJO DEL EDIFICIO VERDE EN LOS EE.UU.

### October 31 is Last Day for Current LEED AP Exam

In preparation for the launch of new exam tracks, the last day to take the current LEED AP Exam will be October 31, 2006. [Read More...](#)

### Leadership Awards Nominations Deadline Extended

Submit nominations until October 15! Honor the people who inspire you with USGBC's Leadership Awards. [Read More...](#)

### World Trade Center Going for LEED Gold

Governor Pataki announced that all the buildings in the WTC development, including Freedom Tower, will seek LEED Gold certification. [Read More...](#)



Rick Fedrizzi with President Bill Clinton and LaDonna Monsees, Newland Communities, at the Clinton Global Initiative Annual Meeting.

### Leadership Award Nominations Now Open!

Nominate a green building leader for USGBC's annual awards. Nominations close October 15. [Read More...](#)

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- November 15-17, 2006
- www.greenbuildexpo.org
- Greenbuild News

# EL CONSEJO DEL EDIFICIO VERDE EN EL MUNDO



UK Green Building Council  
for a sustainable built environment



green building council australia



**EmiratesGBC**

مجلس الإمارات للأبنية الخضراء  
Emirates Green Building Council

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ALTA CUALIDAD AMBIENTAL

**Creada en Francia en 1996 y reconocida de utilidad pública en 2004, la Asociación HQE reúne a los agentes de la construcción civil con el objetivo de desarrollar la calidad ambiental de los edificios de manera concentrada.**

**Una Asociación es un local de trocas, de agrupamiento, de información, de formación y de acción. Divulga las competencias y las experiencias de los asociados al servicio de proyectos individuales y colectivos.**



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## Leadership in Energy and Environmental Design

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LEED Rating Systems

LEED Certification

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LEED-Online

Education

LEED AP Directory

LEED Project Lists

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### What is LEED?

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas: energy efficiency, environmental health, sustainable site development, water efficiency, materials selection, and indoor environmental quality.

LEED provides a roadmap for measuring and documenting building performance throughout the building type and phase of a building lifecycle. Specific LEED programs include:

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- [Guidelines for Multiple Buildings and On-Campus Building Projects](#)
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**1998  
SURGE LA  
CERTIFICACIÓN LEED**

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...Entries: Sustainable Building  
...e 2008

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...ference in

...Leadership  
...award to recognize  
...outstanding contributions to  
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### Association of Conservation Engineers Scholarship

ACE is offering a scholarship to support college juniors and seniors studying engineering, the natural sciences, agriculture, or ecology. Click here...



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- [The ISO Survey sheds light on roles of management system standards in globalization](#)

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- 29 October-3 November, Buenos Aires, Argentina: 22nd plenary meeting of ISO/CASCO

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News and views on ISO's activity in international standardization over almost the entire range of technology, from multimedia applications, safety requirements, interchangeability and compatibility of equipment to the movement of goods, people and services.

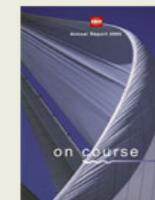
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The American Society of Heating, Refrigerating and Air-Conditioning Engineers advances technology to serve humanity and promote a sustainable world. Membership is open to any person associated with the field.

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ANSI/ASHRAE/IESNA Standard 90.1-2004  
(Includes ANSI/ASHRAE/IESNA Addenda listed in Appendix F)

# ASHRAE STANDARD

## Energy Standard for Buildings Except Low-Rise Residential Buildings

I-P Edition

See Appendix F for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, the IESNA Board of Directors, and the American National Standards Institute.

This standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE Website, <http://www.ashrae.org>, or in paper form from the Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: [orders@ashrae.org](mailto:orders@ashrae.org). Fax: 404-321-5478. Telephone: 404-696-8400 (worldwide), or toll free 1-800-527-4729 (for orders in U.S. and Canada).

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ANSI/ASHRAE Standard 62.1-2004  
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See Appendix H for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, and the American National Standards Institute.

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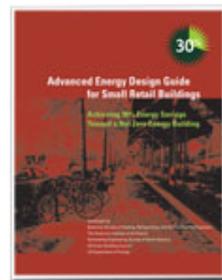


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### Overview/Purpose

The ASHRAE *Advanced Energy Design Guides* (AEDG) are a series of publications designed to provide recommendations for achieving energy savings over the minimum code requirements of ANSI/ASHRAE/IESNA Standard 90.1-1999. The guides have been developed in collaboration with these partnering organizations: The American Institute of Architects (AIA), the Illuminating Engineering Society of North America (IESNA), the U.S. Green Building Council (USGBC), and the U.S. Department of Energy (DOE). The New Building Institute (NBI) participated only in the development of the *Advanced Energy Design Guide for Small Office Buildings*.



The initial series of guides have an energy savings target of 30% which is the first step in the process toward achieving a net zero energy building - defined as a building that, on an annual basis, draws from outside resources equal or less energy than it provides using on-site renewable energy sources. Each

30% Guide addresses a specific building type. Additional guides for existing buildings and at 50%

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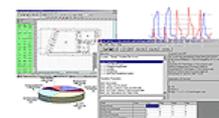
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# EnergyPlus Energy Simulation Software

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EnergyPlus is a building energy simulation program for modeling building heating, cooling, lighting, ventilating, and other energy flows. While it is based on the most popular features and capabilities of BLAST and DOE-2, it includes many innovative simulation capabilities such as time steps of less than an hour, modular systems and plant integrated with heat balance-based zone simulation, multizone air flow, thermal comfort, and photovoltaic systems.



EnergyPlus is a **stand-alone simulation program without a 'user friendly' graphical interface**. EnergyPlus reads input and writes output as text files.

A number of graphical interfaces are [available or under development](#).

### EnergyPlus Awards ▶

Find out what awards EnergyPlus has won in the last few years.

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A flexible curriculum is available to professors teaching courses on energy simulation and using EnergyPlus.

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### ■ UPDATES

[EnergyPlus - Version 1.3.0](#)  
Updated: April 21, 2006

### ■ EVENTS

[SimBuild 2006 IBPSA-USA](#)  
Cambridge, Massachusetts, USA  
August 2-4, 2006

[Building Simulation 2007](#)  
Beijing, China  
Call for Papers--Abstracts Due  
September 15, 2006

[IBPSA-USA Winter Meeting](#)  
Dallas, Texas, USA  
January 27, 2007

[Building Simulation 2007](#)  
Beijing, China  
September 3-6, 2007

### ■ ADDITIONAL RESOURCES

[Comparison of Capabilities of 20 Building Simulation Programs](#)

[Building Simulation User News](#)

[BLDG-SIM](#)

[International Building Performance Simulation Association](#)

[ASHRAE Technical Committee 4.7 Energy Calculations](#)

[Air Infiltration and Ventilation Centre](#)



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Decisions / Rulings ...



Home Energy Solar Incentive Program

# California Solar Incentive Program

The California Public Utilities Commission is committed to solar resources for assuring the reliability of the state's electricity system.

On Jan. 12, 2006, we approved the California Solar Initiative (CSI), a comprehensive \$2.8 billion program that provides incentives toward solar development over 11 years. It also develops complementary policies and rules, sets new incentive levels, and addresses program administration. [Learn about the California Solar Initiative!](#) On Aug. 24, 2006, we adopted performance-based incentives to get the program up and running. Read our [press release](#) and [Fact sheet](#) on the decision.

On March 2, 2006, the Commission opened a proceeding that will allow us to develop rules and procedures for the Solar Initiative and to continue our consideration more generally of policies for the development of cost-effective, clean and reliable distributed generation (DG). [Learn about the implementation of the California Solar Initiative.](#)

**Incentive Levels:** Due to demand for solar rebates, the solar incentive will **change from \$2.80/watt to \$2.50/watt** to preserve program funding.

## Contact Info

During 2006, customers interested in solar incentives offered...

**Residential and small business customers (PV under 30 kW):** Contact the **Commission:**

- 800-555-7794 (toll-free in California)
- 916-654-4058 (outside California)
- Email: [renewable@energy.state.ca.us](mailto:renewable@energy.state.ca.us)

Systems 30 kW or larger, contact your local electric or gas utility. Customers should contact the [San Diego Regional Energy Office.](#)

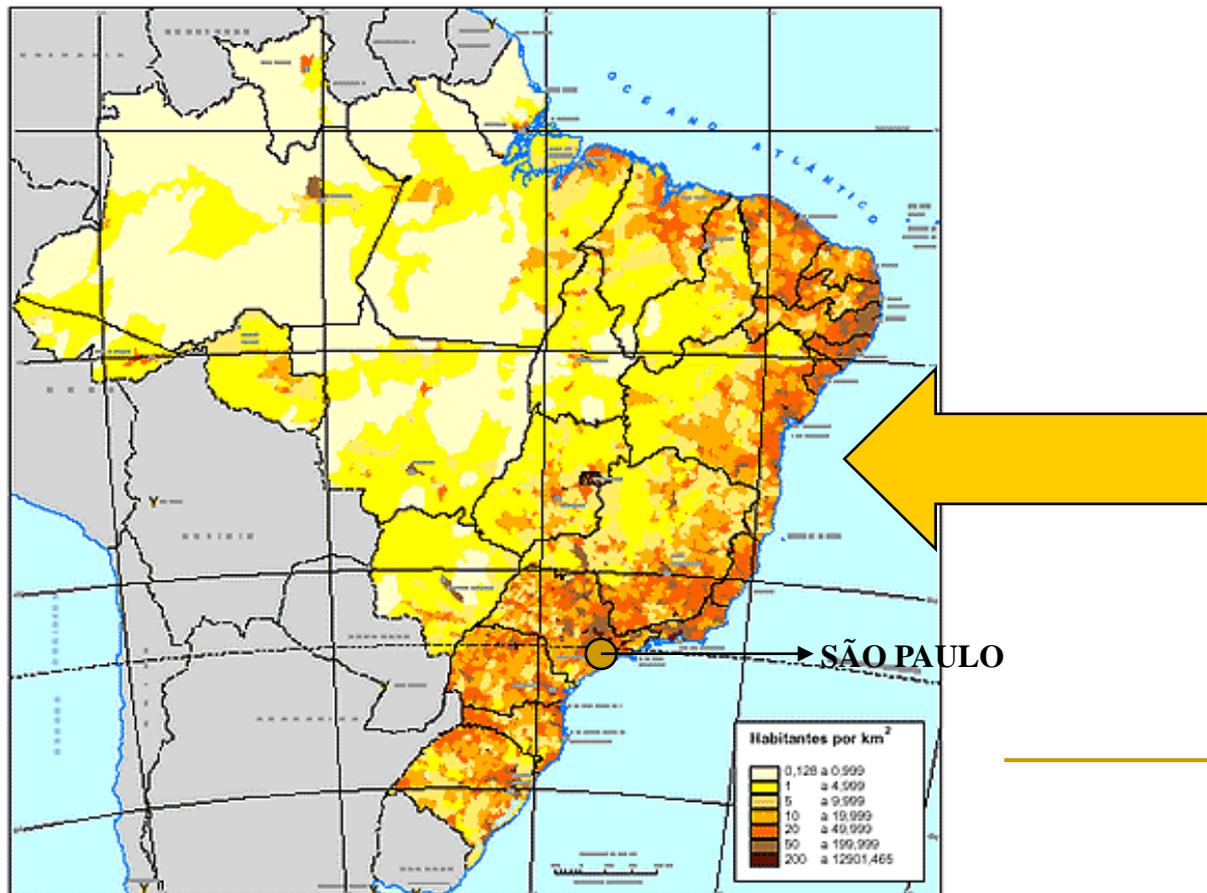
**EDIFICIOS - USA**

**POLÍTICAS PÚBLICAS**

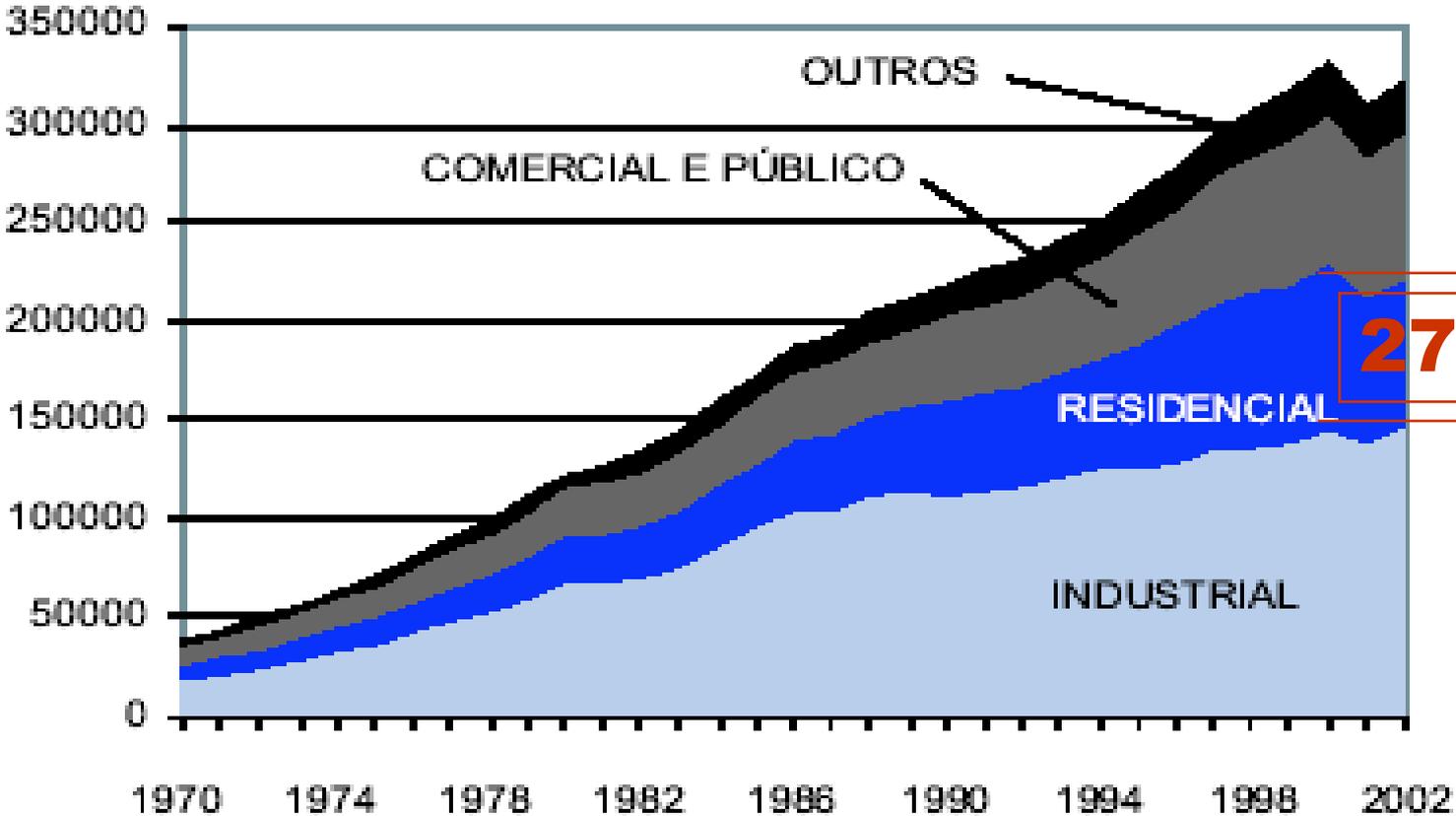
**SURGEN PROGRAMAS DE INCENTIVO**

## BRASIL: DATOS GENERALES – 2006

POBLACIÓN:	186.000.000
■ POBLACIÓN URBANA:	85%
■ HOGARES CON ELETRICIDAD:	96%
■ CONSUMO RESIDENCIAL:	45 kWh/habitante*mês

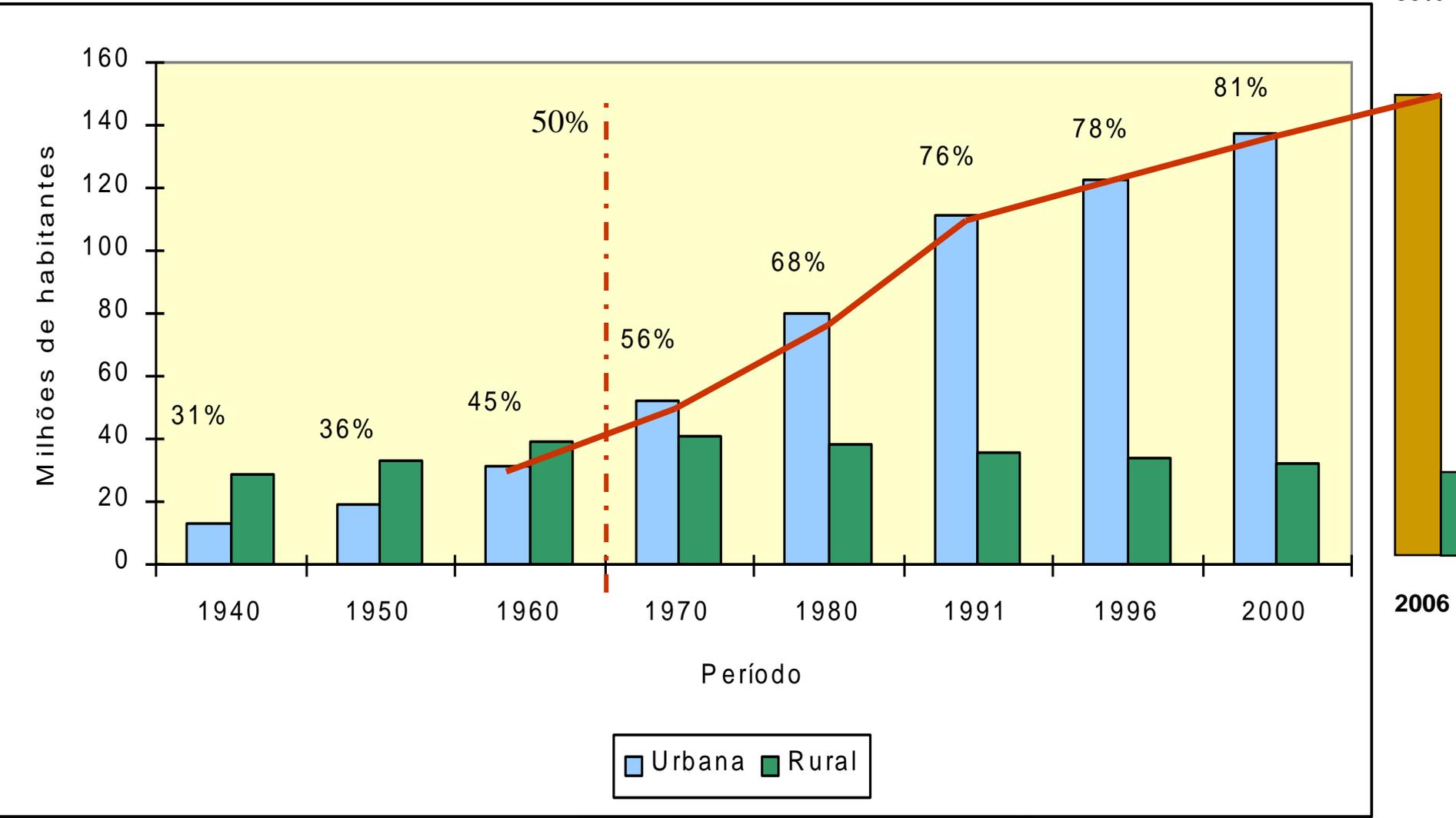


# CONSUMO DE ELECTRICIDAD POR SECTOR BRASIL

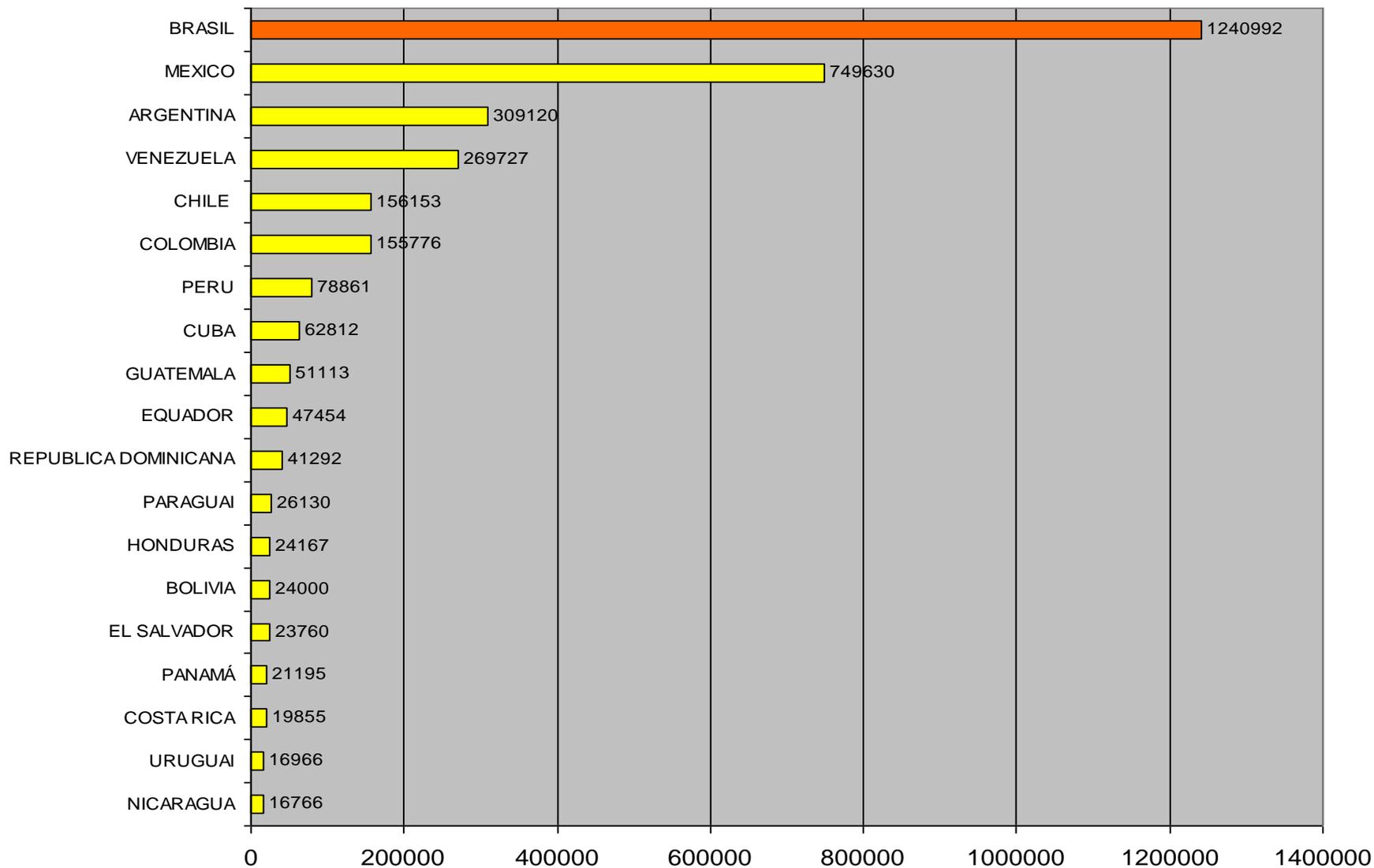


Fuente : BEN (National Energetic Balance)  
2003

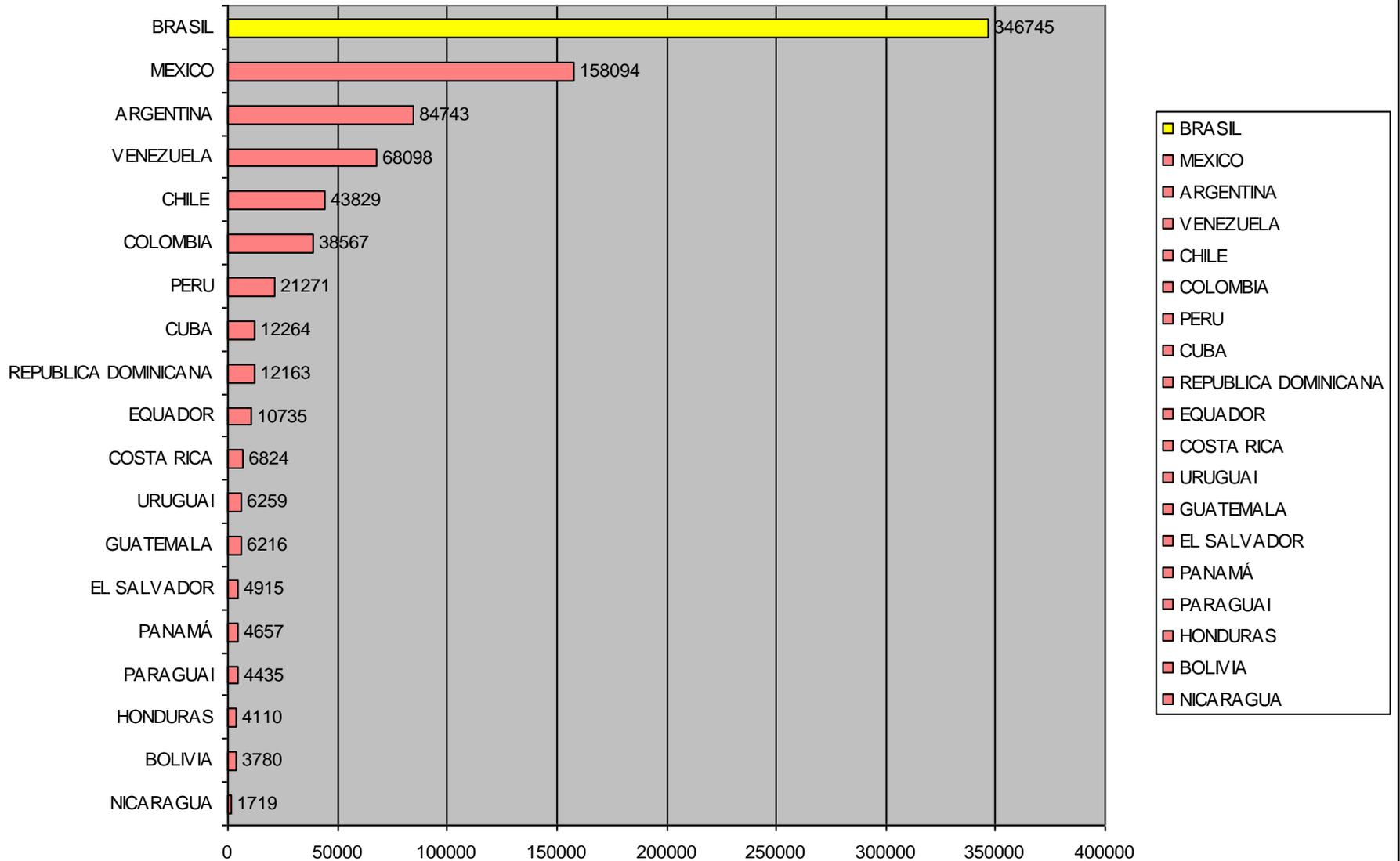
# BRASIL – AUMENTO DE POBLACIÓN URBANA



## CONSUMO FINAL DE ENERGIA (10<sup>3</sup> Boe) - 2004



## CONSUMO DE ELETRICIDADE (GWh) - 2004



## EDIFÍCIOS - BRASIL

FUÉ CREADO EL PROCEL  
PROGRAMA NACIONAL DE CONSERVACIÓN DE ENERGIA ELÉTRICA

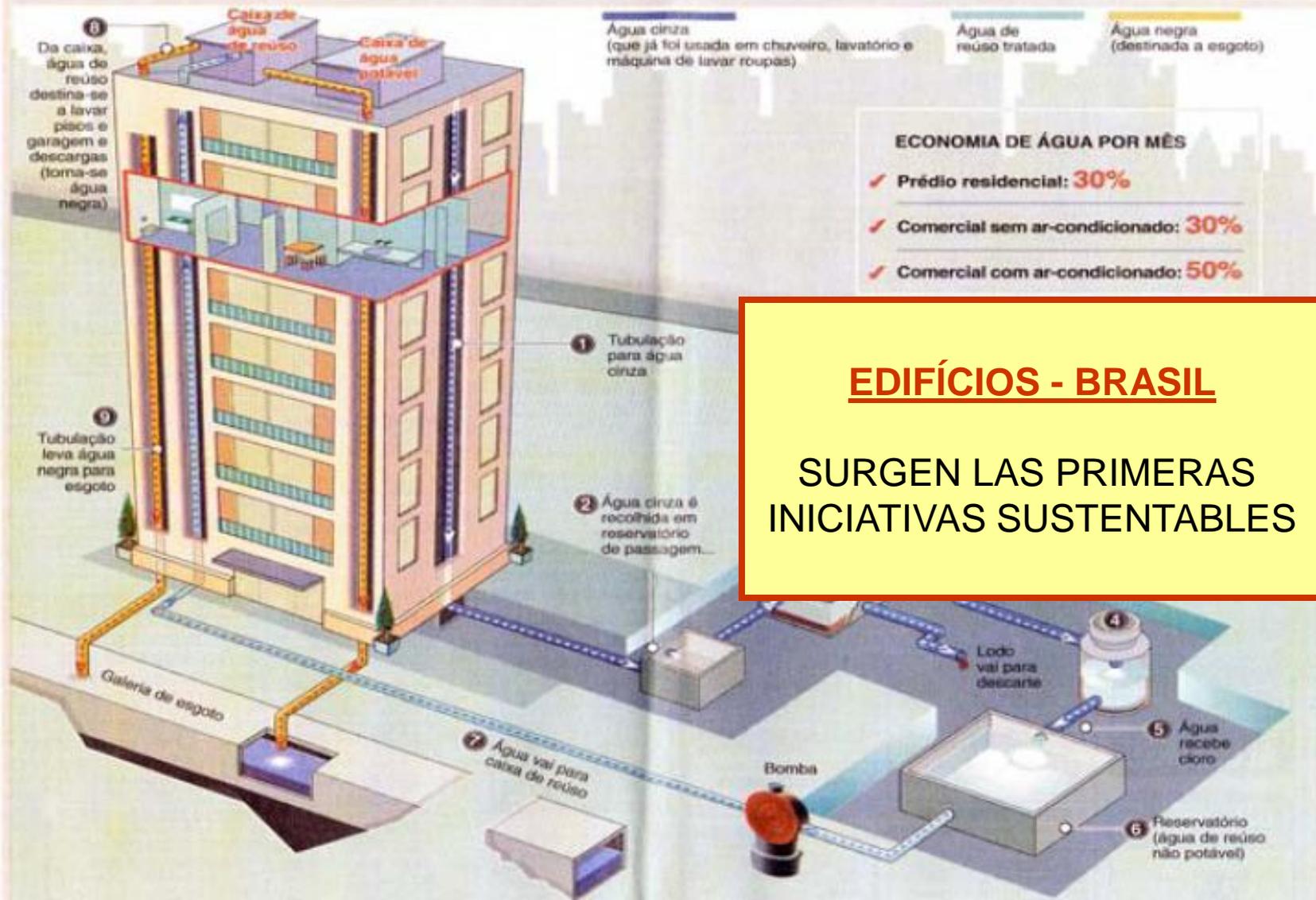


**PROCELEDIFICA**  
EFICIÊNCIA ENERGÉTICA EM EDIFICAÇÕES



# Economia, reaproveitamento e reúso de água em edificações

## REÚSO DE ÁGUA EM PRÉDIOS



**EDIFÍCIOS - BRASIL**

**SURGEN LAS PRIMERAS INICIATIVAS SUSTENTABLES**

## Economia, reaproveitamento e reúso de água em edificações

### Sistema integrado à edificação para reúso



EDIFÍCIOS - BRASIL

SURGEN LAS PRIMERAS  
INICIATIVAS SUSTENTABLES

Arquivo Editar Exibir Favoritos Ferramentas Ajuda

http://www.pure.usp.br/download/Workshop\_SIADEE.pdf

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Internet Security

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## Programa de Uso Racional de Energia e Fontes Alternativas



# Sistema Integrado para Avaliação de Desempenho Energético de Edificações - SIADEE

Prof. Dr. Marcelo de Andrade Roméro  
22.10.2004

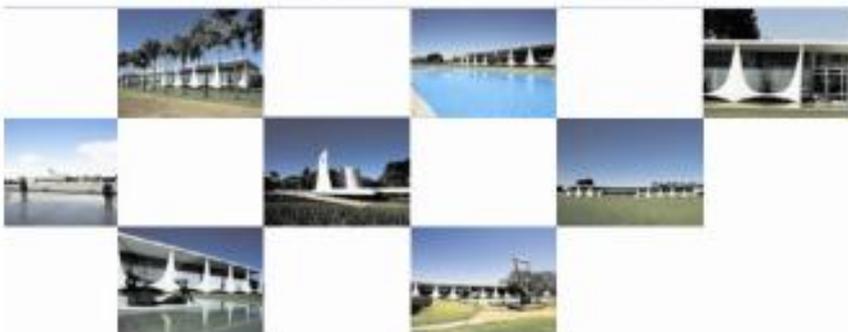


**EDIFÍCIOS - BRASIL**

**SURGEN INICIATIVAS INDIVIDUALES**



Regulamentação para Etiquetagem Voluntária de  
Nível de Eficiência Energética de Edifícios  
Comerciais, de Serviços e Públicos



**EDIFÍCIOS – BRASIL**  
**2007**

REGLAMENTACIÓN ENERGÉTICA  
VOLUNTÁRIA

# **CERTIFICACIÓN VERDE EN BRASIL–USGBC de Brasil**

## **Obras con Certificado Verde - USGBC:**

---

### **Sucursal de ABN Amro Real**

**Ubicación: Cotia, São Paulo**

**Proyecto: Departamento de Ingeniería Banco Real**

**Certificación: LEED Silver**

### **Principales características:**

- **aprovechamiento y el re-uso de agua lluvias y el tratamiento del desagüe para descargas de sanitarios y irrigación del jardín;**
- **los vaciados sanitarios con doble flujo de acción;**
- **sistema de aire acondicionado evaporativo, sin utilización de gases nocivos para el medio ambiente;**
- **programa de reaprovechamiento y reciclaje del escombros generado;**
- **utilización de cemento con mezcla de residuos de altos-hornos siderúrgicos;**

# CERTIFICACION VERDE EN BRASIL–USGBC en Brasil

## Obras con Certificado Verde - USGBC:

---

### Agencia de ABN Amro Real

**Ubicación: Cotia, São Paulo**

**Proyecto: Departamento de Ingeniería Banco Real**

### Principales características:

- las *britas* recicladas, los bloques cerámicos y los paneles divisorios en fibrocemento sin amianto;
- el piso en madera certificada y las tintas a base de agua;
- ~~aprovechamiento de luz natural, por medio de claraboyas;~~
- uso de energía solar para la iluminación de la área de auto-servicio.
- elección de la ubicación adecuada – Alta densidad demográfica y Infra-estructura;

# CERTIFICAÇÃO VERDE EN BRASIL – USGBC en Brasil

## Obras con Certificado Verde - USGBC:

### **Rochaverá Corporate Towers**

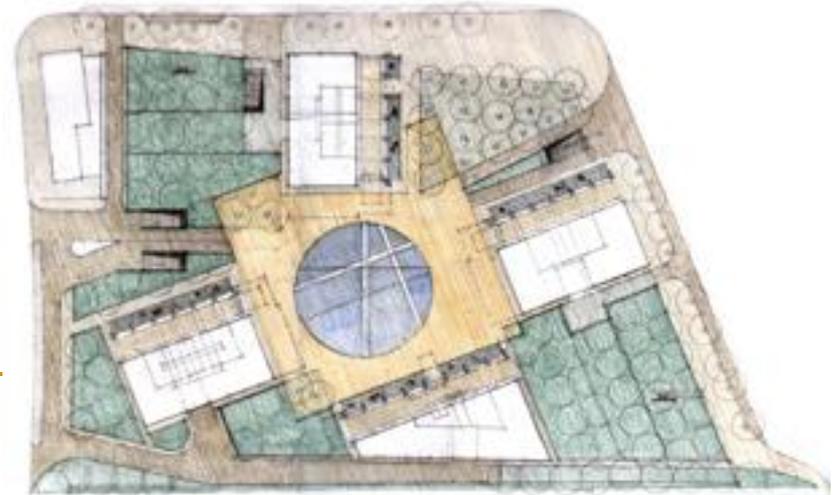
**Ubicación: Av. das Nações Unidas  
(Próximo Shopping Morumbi)**

**São Paulo**

**Proyecto: Tishman Speyer**



- **Rochaverá Corporate Towers**



- **Fotomontaje**

- **Rochaverá Corporate Towers**



- **Planta Pavto Tipo**



- **Perspectiva de la obra**

## Obras con Certificado Verde - USGBC:

---

### Rochaverá Corporate Towers

**Ubicación:** Av. das Nações Unidas, (Próximo Shopping Morumbi),  
São Paulo

**Proyecto:** Tishman Speyer

#### Principales características:

- **80% de los usuarios tienen vista al exterior debido a características como fachada de vidrio;**
- **uso de material reciclado en la obra, como madera certificada y acero;**
- **censores de movimiento para accionar luces en áreas comunes;**
- **espacio para la logística de la coleta selectiva de basura;**
- **uso de agua lluvias para regado de jardines y para el sistema de aire acondicionado;**

# CERTIFICACION VERDE EN BRASIL–USGBC en Brasil

## Obras con Certificado Verde - USGBC:

- **Ventura Corporate Towers**

**Ubicación: Av. República do Chile, Rio de Janeiro**

**Proyecto: Tishman Speyer**



# CERTIFICACIÓN VERDE EN BRASIL–USGBC en Brasil

## Obras con Certificado Verde - USGBC:

- Ventura Corporate Towers



- Skyline – antes y despues

# CERTIFICACIÓN VERDE EN BRASIL–USGBC en Brasil

## Obras con Certificado Verde - USGBC:

---

- **Ventura Corporate Towers**

**Ubicación: Av. República do Chile, Rio de Janeiro**

**Proyecto: Tishman Speyer**

### Principales características:

- **Estacionamiento de Bicicletas**
- **Vaga preferencial p/ automóvil GNV**
- **20% terreno permeable**
- **Techo jardín sobre garaje**
- **Utilización piscinitas en el lote – re-uso de agua**
- **Coleta selectiva de basura (espacio destinado a recepción de la coleta)**
- **Prohibición de fumadores en el edificio**
- **Utilización de madera certificada**
- **Producción de materiales en un radio de no más de 800KM**

# **CERTIFICACIÓN VERDE EN BRASIL–USGBC en Brasil**

## **Obras con Certificado Verde - USGBC:**

---

- **Ventura Corporate Towers**

### **Innovación tecnológica:**

- **Reducción de 40% en el consumo de agua**
    - La reducción exigida por LEED es de aproximadamente de 30%, lo que significa que se recibe un punto extra en esta clasificación.
- 

**Probable Certificación PRATA : 33 puntos**

**Objeto de la certificación – Eficiencia de sistemas**

# CERTIFICACIÓN VERDE EN BRASIL–USGBC en Brasil

## Obras con Certificado Verde - USGBC:

---

### Eldorado Business Tower

**Ubicación:** Av. das Nações Unidas, (frente al Shopping Eldorado),  
São Paulo

**Proyecto:** Gafisa



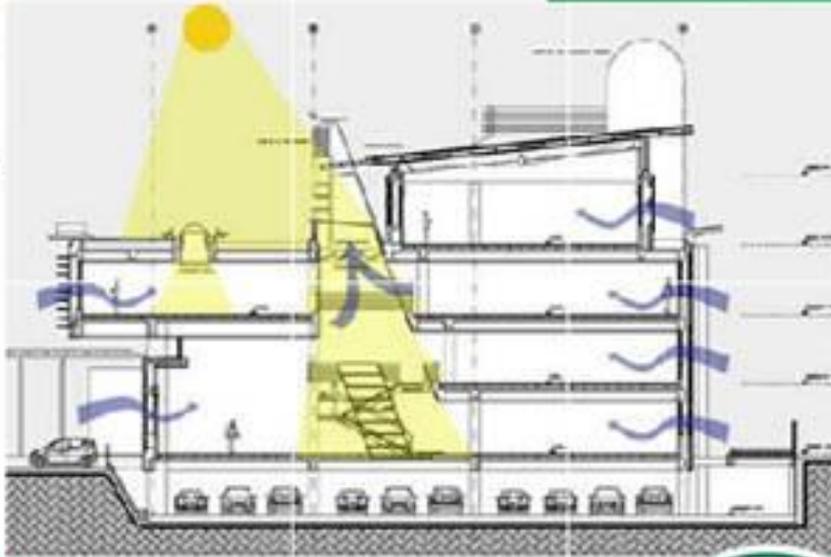
# CERTIFICAÇÃO VERDE NO BRASIL – USGBC no Brasil

English Galeria

**Primavera Office Green**  
*Inteligência inspirada na natureza.*

**Um projeto moderno, correto e definitivo.**

CONSTRUTOR E GERENCIADOR:  
Bautec Construções & Incorporações Ltda.  
End.: av. Othon Gama D'Eça, 900,  
sala 612 A - CEP:88015 - 240  
Centro - Florianópolis/SC  
Fone: (48) 3224-1121  
Responsáveis Técnicos:  
Olavo Fontana Arantes, Eng.º Civil  
Olavo Kucker Arantes, Eng.º Civil, Msc.  
kucker@bautec.com.br



INDICE

**Equipe Técnica**

Início Localização Vantagens ao usuário Vantagens do Certificado LEED



# CERTIFICACIÓN VERDE EN BRASIL–USGBC en Brasil

## Obras con Certificado Verde - USGBC:

---

- Primavera Office Green

**Ubicación: SC 401, Florianópolis**

**Proyecto: Bautec**

### Principales características:

- **Suministro de agua 100% auto-suficiente**
- **ETE – Estación compacta de tratamiento de aguas servidas**

### Climatización Térmica

- **Ventilación natural**
- **Aire acondicionado suministrado por el piso**
- **Ventanas baja ganancia de calor**
- **Muros aislados**

# CERTIFICACIÓN VERDE EN BRASIL–USGBC en Brasil

## Iluminación natural

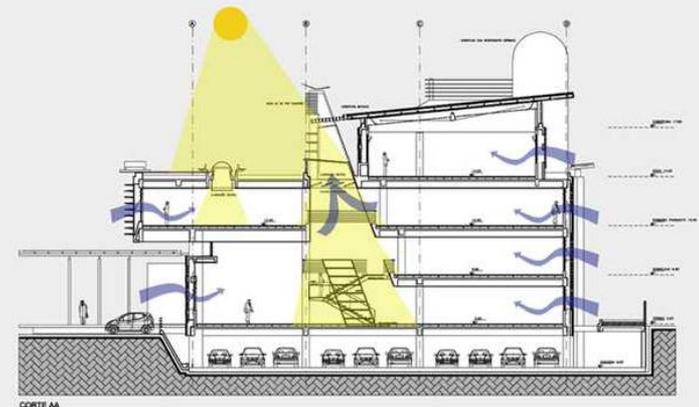
- Iluminación natural cara externa y por el vano central
- Control de luz por cobre-sol

## Iluminación artificial

- Iluminación artificial por zonas
- Control automático de la Iluminación
- Luminarias de bajo consumo de energía

## Calidad del Aire

- Control de partículas sólidas en suspensión en el aire
- Control de dióxido de carbono
- Control de gases



# CERTIFICACIÓN VERDE EN BRASIL-USGBC en Brasil

## Estética

- Escritorio Jardín
- Aberturas con vistas para áreas verdes
- Arquitectura comercial innovadora
- Edificio verde

## Apoyo al usuario

- Vestuario de apoyo al ciclista
- Sala de reposo y diversión



- Primavera Office Green - USGBC en Brasil



- Vista General del emprendimiento

- Primavera Office Green - USGBC no Brasil



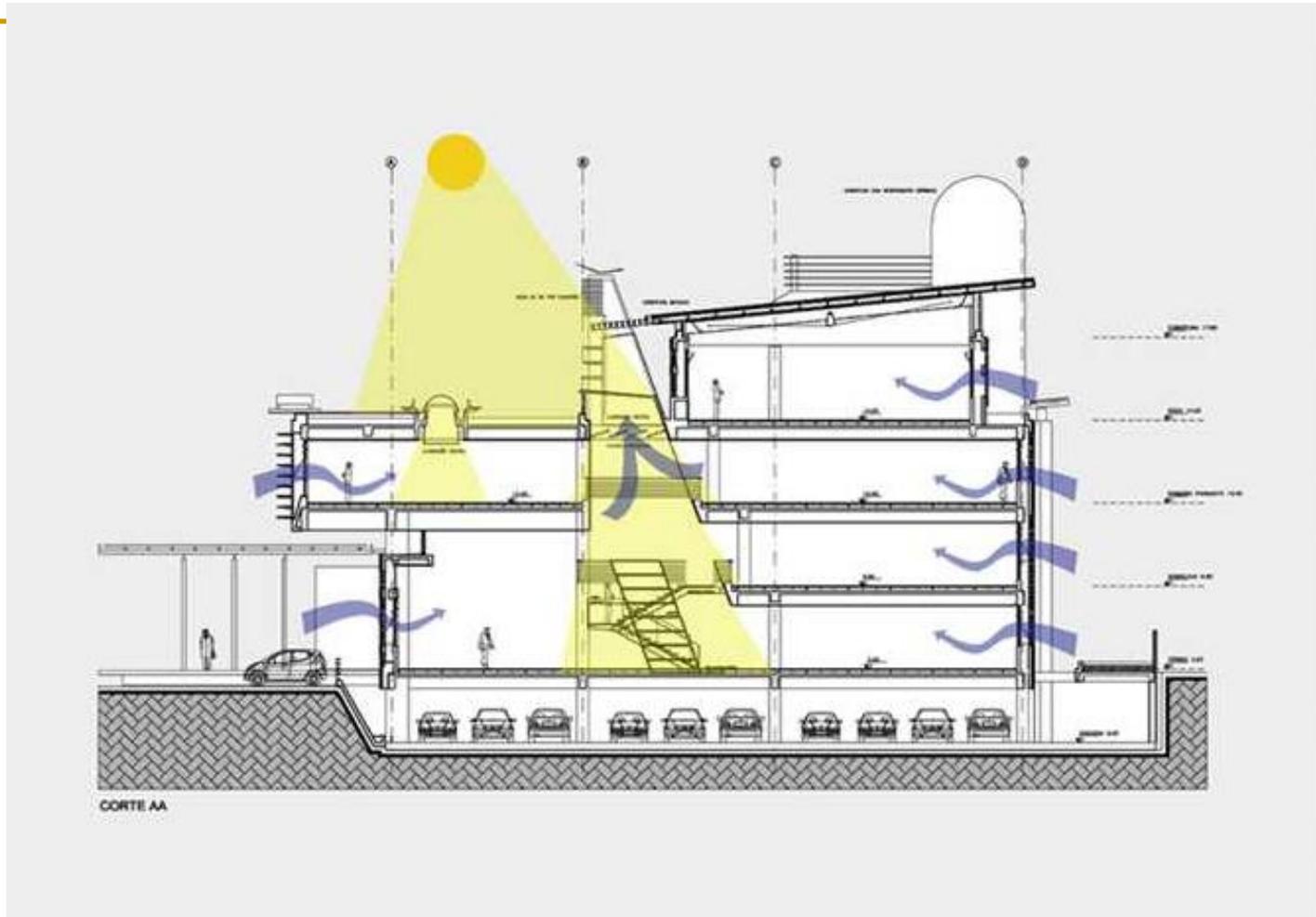
- Iluminación natural – abertura del vano central

- Primavera Office Green - USGBC en Brasil



- Concepto del Escritorio Jardín

- Primavera Office Green - USGBC en Brasil



- Iluminación y ventilación natural

- Primavera Office Green - USGBC en Brasil



**Primavera Office Green**  
*Inteligência inspirada na natureza.*

[English](#) | [Galeria](#) | [Contato](#)

## Cronograma

Item	Descrição	Projetos									
		Abr/05	Mai/05	Jun/05	Julh/05	Agos/05	Set/05	Out/05	Nov/05		
01	Projetos										
01.01	Projetos										
01.02	Aprovação do Proj. Arquitetônico (PMF)										
01.03	Laudos, Vistorias e PCMAT										
01.04	LEED										

Item	Descrição	Projetos											
		Dez/05	Jan/06	Fev/06	Mar/06	Abr/06	Mai/06	Jun/06	Julh/06	Ago/06	Set/06	Out/06	Nov/06
02	Obras												
02.02	Instalações Provisórias												
02.03	Serviços em Terra												
02.04	Infra-Estrutura												
02.05	Supra-Estrutura												
02.06	Estrutura Metálica												
02.07	Paredes												
02.08	Impermeabilização												
02.09	Instalações Elétricas												
02.10	Cabeamento Estruturado												

Início
Localização
Vantagens ao usuário
Vantagens do Certificado LEED



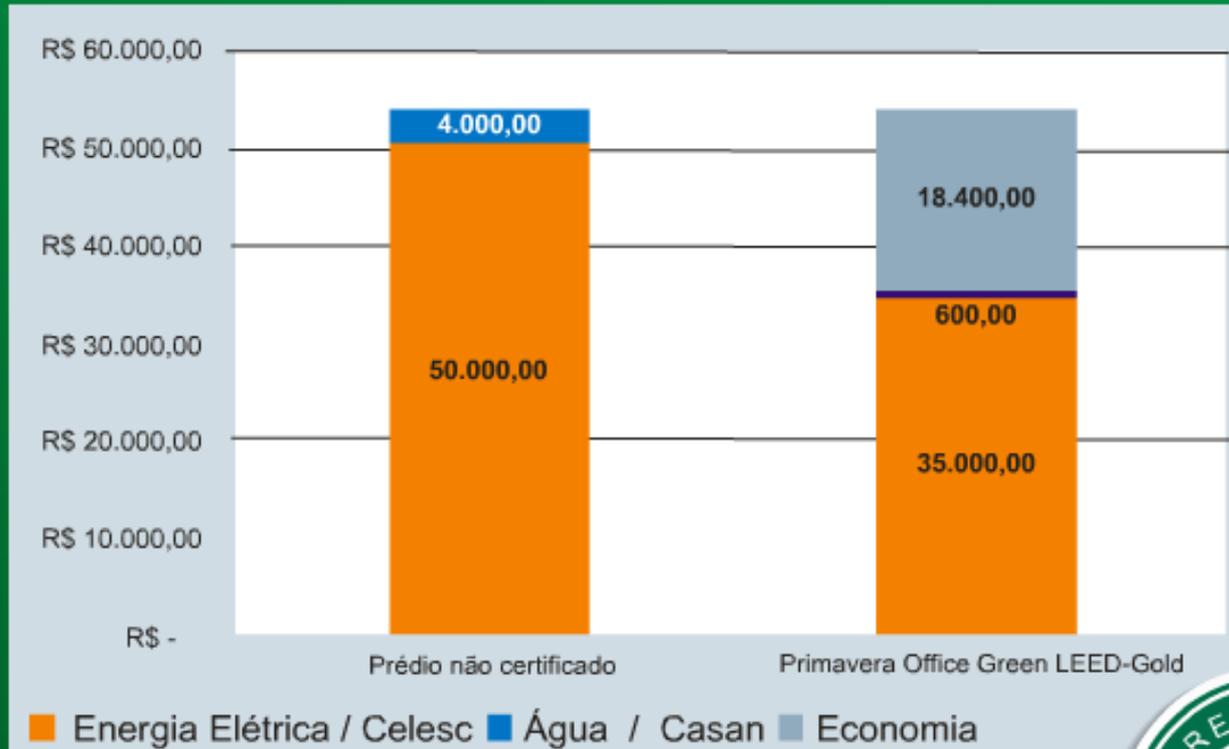


ÍNDICE

- Cronograma de proyecto y obras

# • Primavera Office Green - USGBC em Brasil

## Estimativa da Redução no Custo Mensal de Água e Energia



O Projeto

Localização

Vantagens ao usuário



## Estimativa de Maior Produtividade

### "Produtividade e Qualidade do Ambiente Interno"

Estudo do Instituto de Gestão de Energia Natural (NEMI- USA)

**Conclusão - Ganhos de 1,5% são concretos e conservadores em prédios eco-sustentáveis**

Considerando-se 650 pessoas temos um ganho de aproximadamente 10 colaboradores.(R\$30.000 / mês)

- **Mejor productividad de los usuarios proporcionada por la mejora en la calidad ambiental**

- Primavera Office Green - USGBC en Brasil

English | Galeria | Contato

# Primavera Office Green

*Inteligência inspirada na natureza.*

O Projeto | Localização | Vantagens ao usuário | Vantagens do Certificado LEED

📅 20/09/2005

## Data do Registro LEED do Primavera Office Green

O sistema de Certificação LEED - Liderança em Energia e Design Ambiental do US Green Building Council, para novas edificações, é um instrumento útil para avaliar o desempenho ambiental durante o ciclo de vida de uma edificação. O primeiro empreendimento no Brasil buscando a Certificação LEED Gold, cada vez mais valorizada no mercado imobiliário internacional. Associar sua marca ou negócio ao Primavera Office Green é um investimento com retorno garantido.

**Certificação LEED**  
20/09/2005  
USGBC • WASHINGTON

U.S. GREEN BUILDING COUNCIL

Fechar

APROVADO  
20/07  
2005  
P.M.F. - SUSP

APROVAÇÃO  
P.M.F. - SUSP - S  
53.812  
ASE - E - CASBRIC  
ATENÇÃO: A OBRA NÃO PODE  
INICIAR APÓS A DATA DO DIA  
CONSTRUÇÃO JUNTO A P.M.F.

PRIMAVERA GREEN OFFICE

MOX

Saiba mais sobre:

**LEED** LEED™ Green Building Rating System  
LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN

SISTEMA DE CLASSIFICAÇÃO DE CONSTRUÇÕES VERDES

- Informaciones en el site del proyecto sobre el registro en la USGBC

# CERTIFICACIÓN VERDE EN BRASIL–USGBC en Brasil

## Artículo revista Arquitectura y Construcción – Abril 2007:

“Creada en la década del 1970 por arquitectos y ecologistas, el termo, en estricto rigor, significa "construcción verde". En el contexto de los ambientalistas, ser verde implica estar de bien con la naturaleza, no agredirla. Traducido para la arquitectura, una construcción verde, entonces, es aquella proyectada, construida y mantenida con el mínimo consumo de agua y energía, dando prioridad a materiales que no contaminan el medio-ambiente durante su producción y no provocan daños a la salud de los usuarios. Con el crecimiento de los movimientos ambientalistas y la demanda de la legislación y de los inversores extranjeros, invertir en la calidad y en la gestión ambiental paso a ser también un buen negocio.”

- **Emprendimiento en Florianópolis (SC), de la constructora Bautec, está siendo construido para obtener la certificación del LEED como modelo de edificio sustentable.**





# Green Building Council do Brasil

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## Benefícios do Green Building

Seg, 05/14/2007 - 11:29

### • Aumento de eficiência

- Energética
- Uso de água
- Utilização de Materiais

### • Redução do impacto ambiental

### • Melhoria da qualidade do ambiente interno

- Maior satisfação dos usuários;
- Redução dos problemas de saúde;
- Maior produtividade.

## Depoimentos

"Estamos em um momento de transição da lógica econômica para a prática sustentável. Com o tempo, poremos em prática a reutilização da água e a utilização de fontes renováveis de energia na maioria dos empreendimentos."

— João Pacheco, Cushman & Wakefield

## Membros fundadores



---

# EL USO RACIONAL DE LA ENERGÍA Y EL PROYECTO DE LA ARQUITECTURA

---

# CUESTIÓN FUNDAMENTAL

El conocimiento del clima local para la concepción del proyecto de arquitectura se toma en consideración:

- Radiación solar incidente
  - Temperatura del aire
  - Velocidad y dirección de los vientos
  - Humedad relativa del aire
-

---

# DISEÑO SOLAR PASIVO

El diseño solar pasivo podrá mejorar el desempeño energético del edificio en tres áreas: enfriamiento, calefacción y iluminación.

La importancia relativa de cada una de estas áreas para la economía de la energía varía conforme el local y la función del edificio.

Sus efectos se suman, ya que cada tecnología pasiva utilizada puede contribuir para cada una de las tres áreas simultáneamente.

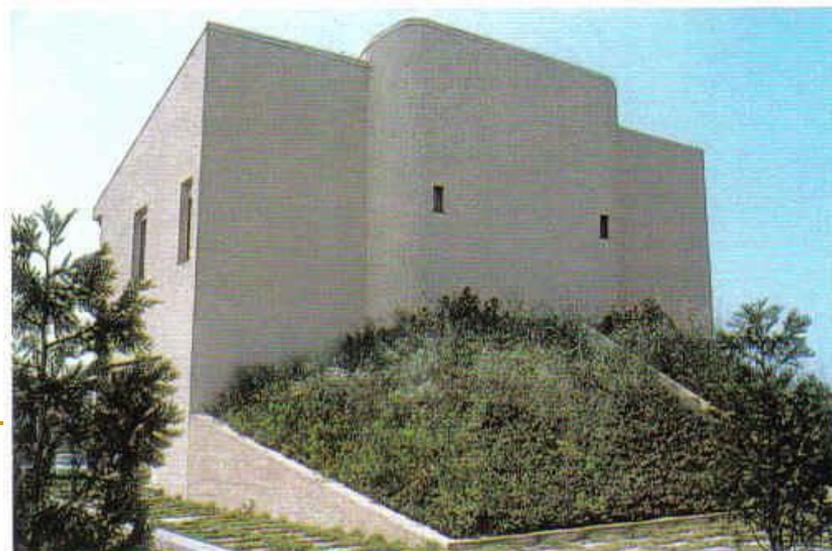
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# ORIENTACIÓN SOLAR



*Fachada Sul*

*Fachada Norte*









SARAWATI  
MNC

mnc

ATM  
MNC

# FORMA EDIFICADA

