THE SOLAR BOARD

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Sponsors:

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INTERNATIONAL SOLAR ENERGY FORUM ON THE DEVELOPMENT OF SOLAR TECHNOLOGY AND INDUSTRY UNDER THE FINANCIAL CRISIS
Lanzhou, China, 15-17 Oct, 2009

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The SOLAR BOARD is a multidisciplinary group that advocates for the inclusion and development of the Solar Energy in Uruguay.

Aim:

Enhance the use of solar energy in Uruguay, promoting the creation of an infrastructure that leads to the development of solar systems and coordinating actions among institutions linked to the theme.

INTRODUCCIÓN

ORIGEN

August 2007- The SOLAR BOARD was launched at the IV Regional Forum of Renewable Energy. Montevideo - Uruguay

- Sponsors:

- Executive Secretary

Members

Professional and Technical Associations

Sociedad de Arquitectos del Uruguay
Asociación de Ingenieros del Uruguay
Asociación de Ingenieros Químicos Del Uruguay
Asociación de Ingenieros Tecnológicos del Uruguay
Asociación de Instaladores Sanitarios del Uruguay
Asociación de Instaladores Térmicos del Uruguay
Unión de Instaladores Sanitarios del Uruguay.

Private Companies

Asociación de Promotores Privados del Uruguay
Asociación Nacional de Micro y Pequeñas Empresas
Asociación Uruguaya de Acondicionamiento Térmico
Consultores privados
Empresas varias relacionadas a la técnología

Public and Private Universities

Universidad de Montevideo - Centro de Producción Más Limpia
Universidad ORT - Facultad de Arquitectura
Universidad de la República - Facultad de Arquitectura
- Facultad de Ingeniería
Universidad del Trabajo - Consejo de Educación Técnico Profesional
- IEC

State Companies , Local Goverments Ministeries and State Organizations

Intendencia Municipal de Canelones
Intendencia Municipal de Montevideo
Intendencia Municipal de Tacuarembó
LATU
Comisión de Industria, Energía y Minería del Senado de la República,
MIEM-DNETN-Proy. Eficiencia Energética
MVOTMA-Unidad Cambio Climático y Dirección Nacional de Vivienda
URSEA
UTE

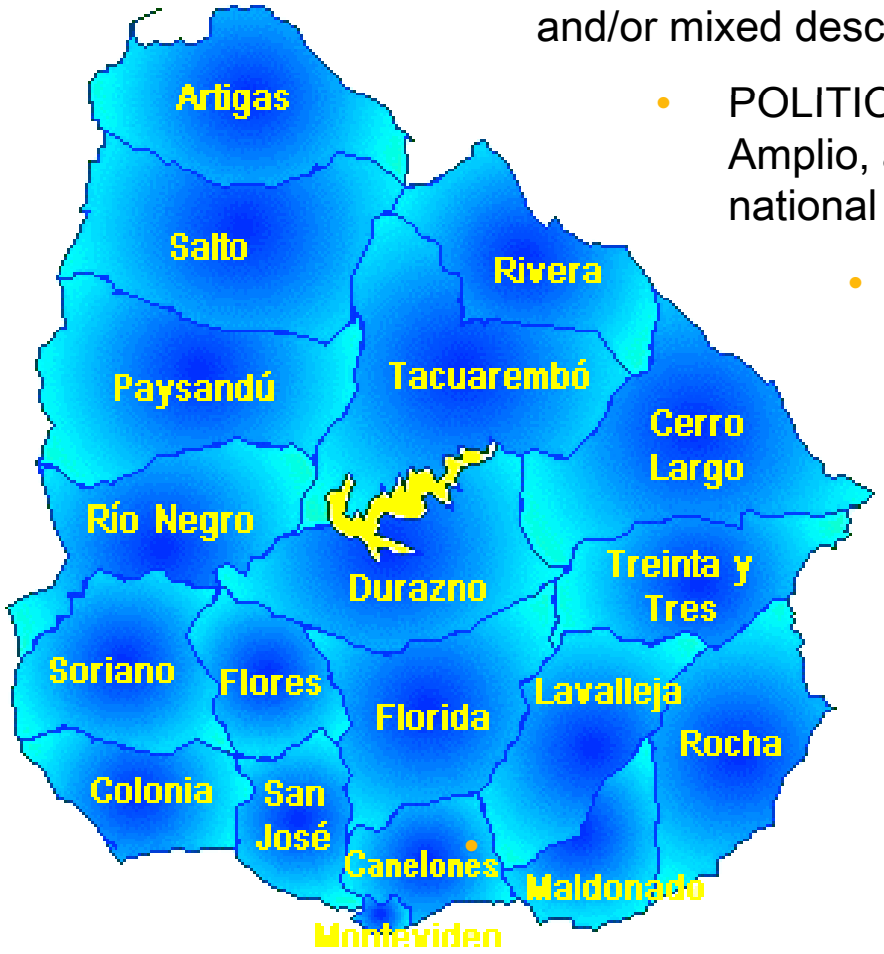
Other

REDES-Amigos de la Tierra
FUCVAM
UNIT - Instituto Uruguayo de Normas Técnicas

URUGUAY

- AREA: In shore 176.215 Km2 ,Off shore 125.057 km²
- POPULATION: 3.240.000 hab.
- POPULATION CHANGE 1996-2004: 2.6%
- POPULATION DENSITY: 18.8 hab/km^2
- LIFE EXPECTANCY : 76 years
- AVERAGE POPULATION PER HOUSEHOLD: 3,2
- LITERACY RATE: 97%

URUGUAY

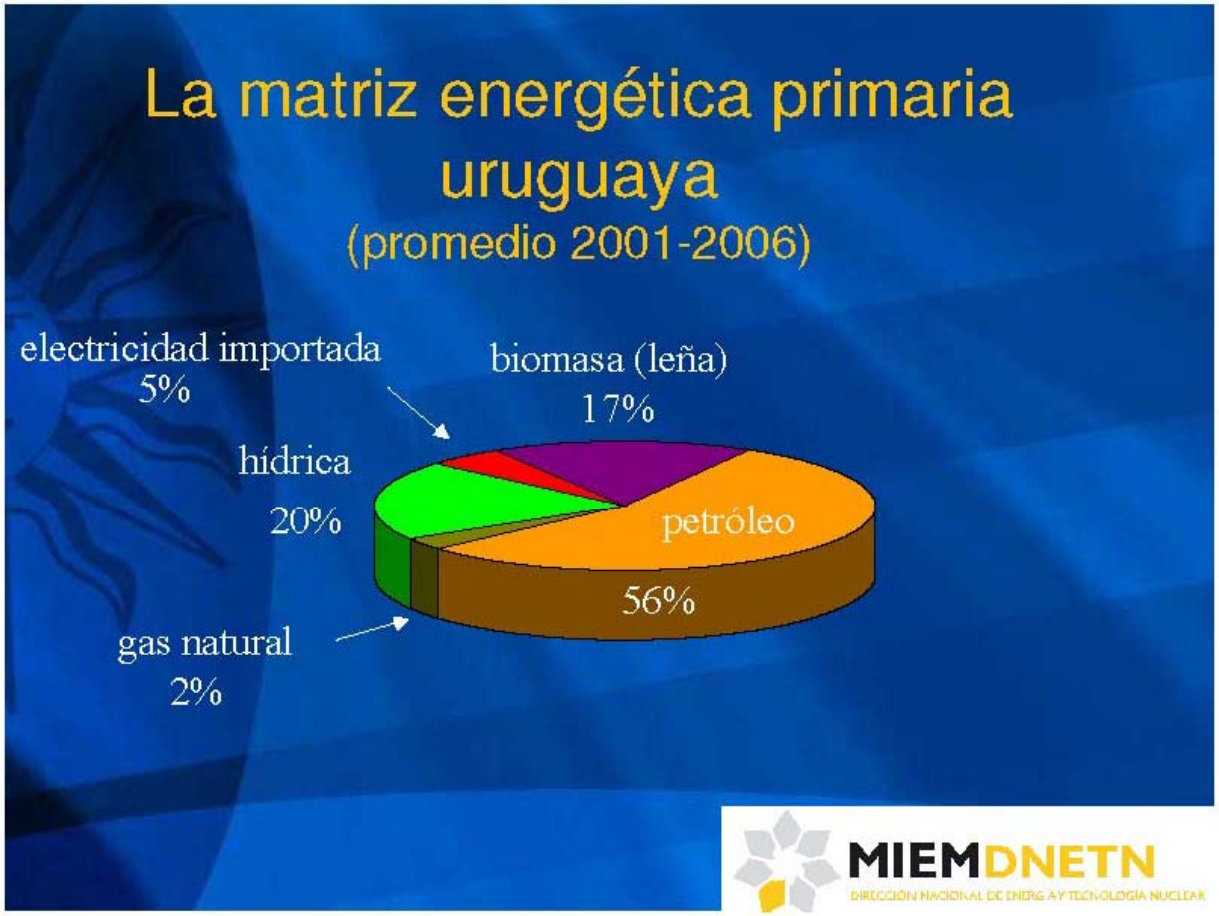


- ETHNICITY: 88-94% of the population is of mostly European and/or mixed descent.
- POLITICS: Uruguay is a Democratic Republic. Frente Amplio, a coalition of left parties, forms the current national government (05-09).
- CORRUPTION : The CPI ranks Uruguay with 6.7 (Nº25 in the world) same place as Spain. And the first place with Chile in Latin America.
- ECONOMY: Uruguay's economy has historically been based on livestock production. Recently, other industries such as tourism, financial services and software industry have been developed.

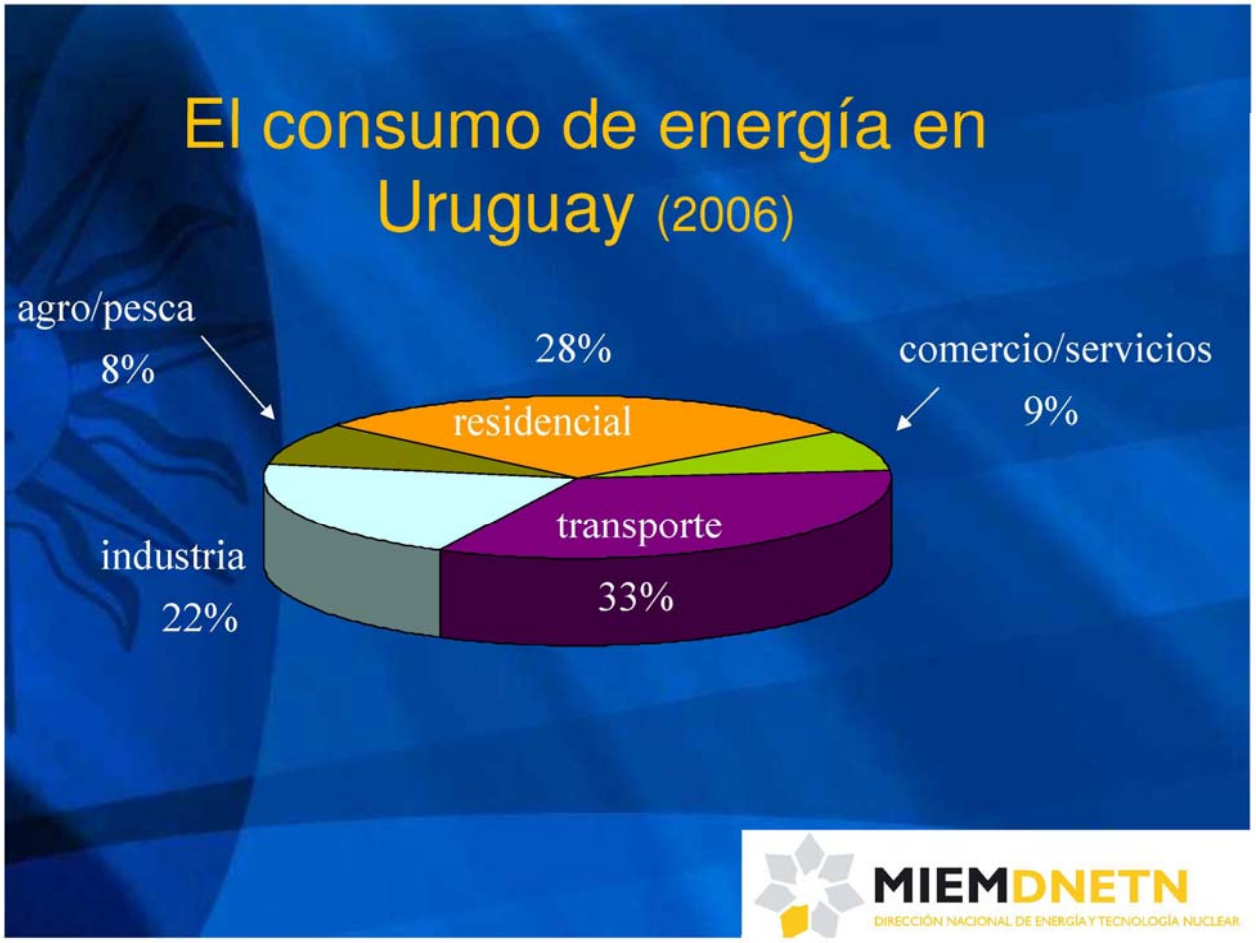
National Energy Situation in 2008

- ✓ High dependency on petroleum (double of the world-wide average).
- ✓ Limited local energy resources (35 % to 40%).
- ✓ Difficulty to guarantee energy supply.
- ✓ Absence of a developed culture on energy efficiency.

Uruguayan Primary Energy Supply



The Power Consumption in Uruguay



Strategic Directives

Diversification of the energy supply

- to guarantee energy supply at a reasonable price

  - to reduce dependency on imported petroleum
  - to increase participation of local energy resources
  - to promote introduction of nontraditional renewable sources (wind, solar, biomass, bio-fuel)

- introduction of other sources (natural gas and possibly coal and nuclear)

- to stimulate entrepreneurships to generate local development

- to guarantee environmental awareness

- to approve a law on energy efficiency –September2009

- to approve a law on thermal solar energy – September 2009

Governmental Goals - Medium Term

Composition of the energy supply

- Guaranteed natural gas supply
- 30 % of used agro-industrial residues for energy production
- 5 % of electrical energy of nontraditional renewable sources (wind, solar, biomass)
- reduce petroleum energy supply to 45 %
- reduce petroleum used for electricity generation by 10 %

Guidelines to Change the Energy Supply the Electrical Sector.

To introduce renewable energy technologies

- 200 to 300 MW of wind energy
- 200 MW of biomass
- 50 MW of hydropower
- Photovoltaic pilots farms
- Micro Wind Energy generation and Solar Water Heating for Domestic use, Small and Medium Enterprises

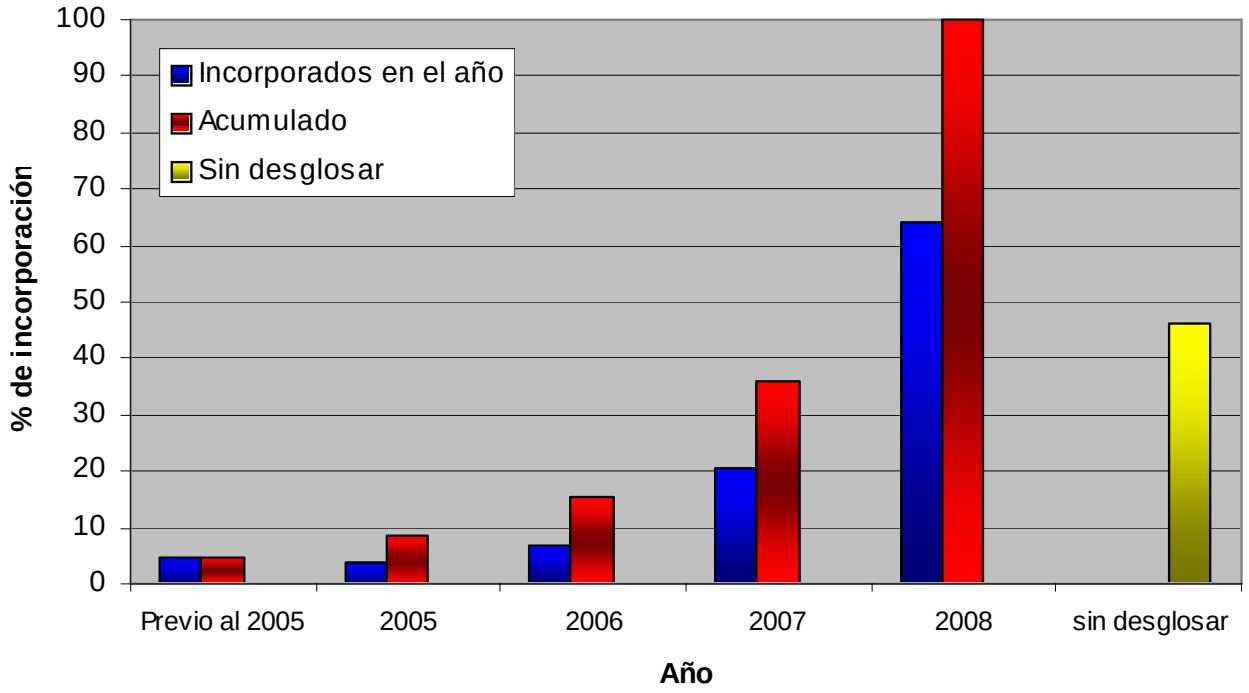
Current Situation of Solar Thermal Energy

Installed Surface Area

Installed Total Surface Area - 4.870 m^2 Surface in Operation - 3.820 m^2

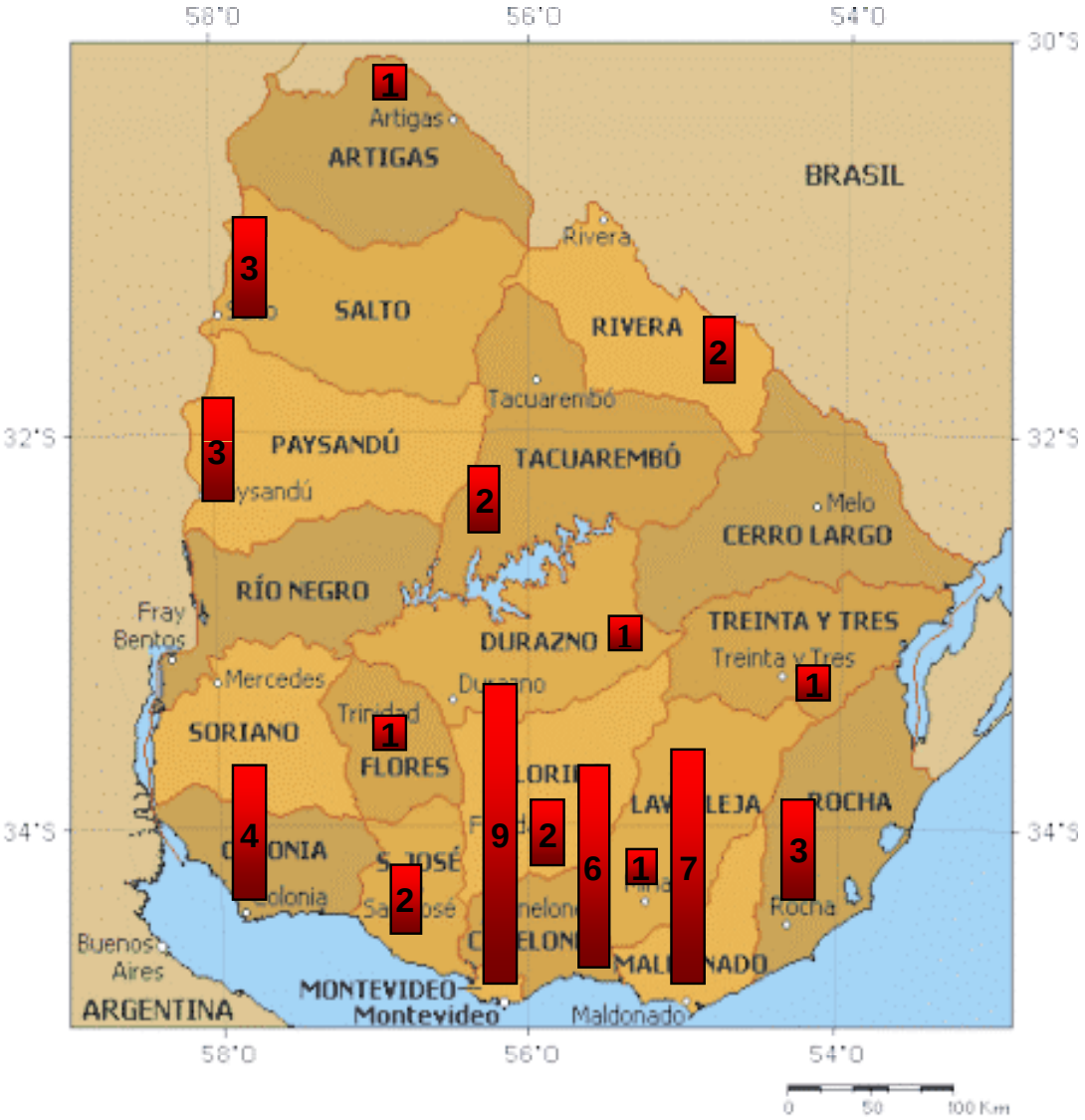
In Operation - 78 % Installed Surface per capita - 1.5 m^2/1.000 inhabitants

Increase in Installed Surfaces

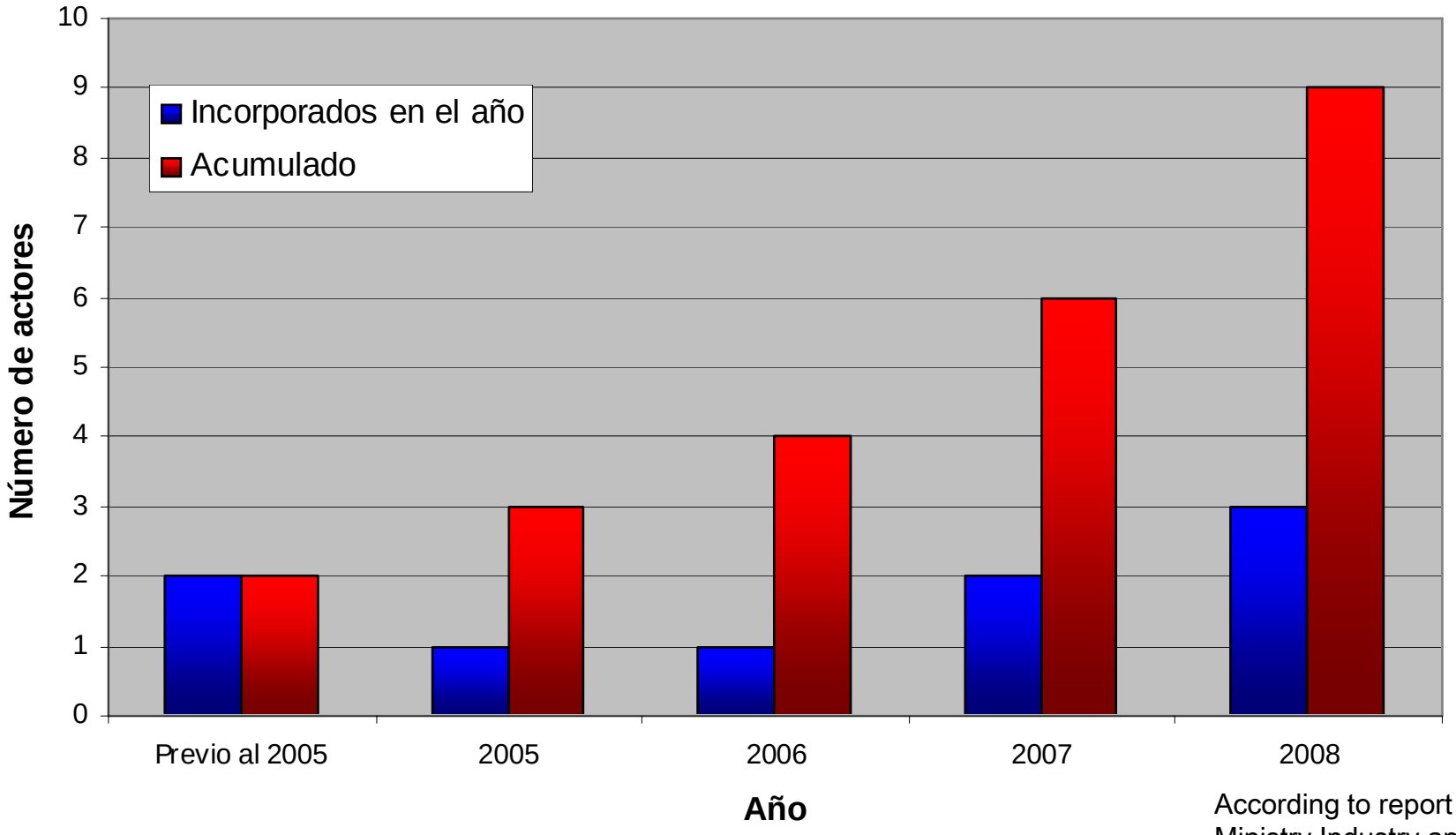


According to report of the Ministry Industry and Energy of Uruguay – February 2009

Geographic Distribution



Importers – Producers of Solar Collectors



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Comparative advantages of Solar Energy

- ENVIRONMENT
  - It is a self sufficient energy resource, clean, quiet, free and reliable.
  - Replaces fossil fuel and biomass consumption, preventing or slowing the depletion of limited natural resources.
  - Renewable
  - Clean

Comparative advantages of Solar Energy

- STRATEGIC

  - Reduces reliance on imported energy supply.
  - It promotes self-sufficiency and energy independence.
  - It involves a paradigm shift in energy production, which will progressively decentralize.
  - It positions Uruguay as an environmental responsible tourist destination.

Compartive advantajes of Solar Energy

- SOCIAL INTEREST

- Generation of skilled jobs directly employed in production, and jobs in installation and maintenance of facilities.

Energy	employment generated per Tera watt-hour
Nuclear	75
PCHs	120
Gás natural	250
Hidroeletricidade	250
Petróleo	260
Petróleo *offshore*	265
Carvão	370
Lenha	733 - 1.067
Eólica	918 - 2.400
Álcool	3.711 - 5.392
Solar (fotovoltaica)	29.580 - 107.000

Reference “Ciudades Solares

Comparative advantages of Solar Energy

- ECONOMICS

- Direct reduction in the consumption of electricity, fuel oil, gas or biomass.

- The investment is recovered with the saved energy consumption in a short period.

  - In the case of swimming pool the period could be about 3.5 years.

  - In the case of hotels, when the former energy is electricity, this period could be 4 to 5 years.

ACHIEVEMENTS 2008-2009

THERMAL SOLAR ENERGY LAW . Approved in September 2009.

Summary

Articles 1 and 2
The new law states that solar energy is of **national interest** and gives the Executive the power to grant **tax exemptions**.

Article 3 , 4 and 5.
For new **health care centers, hotels and clubs** where its forecast for hot water consumption involves more than 20% of total energy consumption, solar heating is mandatory for at least 50 % of its available energy to heat water

Article 6
All those new **public sector buildings** whose forecast for hot water consumption involves more than 20% of total energy consumption must have, within five years of promulgation of this law, at least 50 % of its available energy to heat water using solar thermal energy.

ACHIEVEMENTS 2008-2009

THERMALSOLAR ENERGY LAW . Approved in September 2009.

Article 7 –
The Ministry of Industry, Energy and Mining may require from all new **industrial or agro-industrial enterprises**, a technical assessment of the feasibility of installing solar collectors.

Article 8 .-
The new **heated pools** or those existing that would be re-conditioned, must have full equipment for heating water by solar energy, provided that no use other renewable energy sources are used for this purpose.

Article 9 and 10 .
The Ministry of Industry, Energy and Mining, determines the required and applicable **regulations**. While The Executive, in consultation with relevant agencies, may determine **exemptions** through regulation, for reasons such as water consumption volume, area, size of equipment, hours of shade or use other mechanisms power generation.

ACHIEVEMENTS 2008-2009

THERMAL SOLAR ENERGY LAW . Approved in September 2009.

Article 11 and 12 .
The Ministries of Industry, Energy and Mining, Social Development and Housing, Territorial Planning and Environment will be responsible for coordinating a **program to ensure facilitation in the use of solar thermal energy**. To authorize the Executive to the exoneration and release all or part of the **Value Added Tax** (VAT), Specific Internal (IMESI) and **customs taxes**, on solar collectors and domestic manufacturing uncompetitive with imported domestic industry as well as goods and services uncompetitive domestic and imported with the domestic industry, necessary for their manufacture.

ACHIEVEMENTS 2008-2009

- UNIT (Uruguayan Institute For Technical Norms)

TECHNICAL COMMITTEE IN ENERGY EFFICIENCY OF SOLAR COLLECTORS.

Approved documents:

- **UNIT-ISO 9806-1**, Thermal performance of glazed solar collectors considering the pressure drop.
- **UNIT-ISO 9806-2**, Test proceeding for qualification.
- **UNIT-ISO 9806-3**, Thermal performance of Unglazed solar collectors, considering the pressure drop.
- **UNIT-ISO 9488**, Solar energy. Glossary.
- **UNIT 705**, Solar collectors – Requirements.
- **ISO 9459-2**, Sanitary water heating. Part 2: External test methods for characterization and prediction of annual performance of Solar Systems.

PROJECT 2010

Project "Piriápolis Solar City"

A Solar Board proposal supported by local institutions: Tourism Promotion Association. (Member of the Commercial Association, Association of Real State Agencies, Hotel and Restaurants Association, Local Government, and Ministry of Tourism).

Photovoltaic Solar Farm

Supported by the Japan International Cooperation Agency (JICA) (Cool Earth Program)

It will be connected to the local energy grid, and it will supply 300 kW, in the north area of Uruguay.

URUGUAY

m^2 solar collector per 1000 hab. **Year 2006**

Israel	770
Chipre	730
Austria	343
Alemania	104
Dinamarca	69
España	15
Holanda	39
China	74
Brasil	17

Uruguay (m2 cada 1000 habitantes)

1.5 Lat 31º - 34º S

Goal in Solar Energy

If Uruguay pretend to achieve a goal of 10 m2 of solar collectors per 1000 hab., it should install 35.000 m2, that could means an installed capacity of 24MW.

MESA SOLAR

Thank you!
Muchas gracias!
Xie-xie!

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