




“The Energy Efficiency in Cuba”


Tokio. Japan. July 2018





My Country


1. ...
2. ...
3. ...
4. ...
5. ...


-  **Republic of Cuba:** formed for over 1600 islands, islets and keys, being the Island of Cuba the largest.

-  **Total Territory** 109 mil 884,01 km². The bigger heighth on the sea level is TURQUINO PEAK 1 974 meter. In Santiago de Cuba Province.

-  The country has 16 provinces and its capital is **Havana City**

-  **Population. The Country has** 11 millions 163 mil 934 habitants, a density of 101,6 hab/km².

-  **Temperature.** The temperature oscillates between 17,6 y 32,8 grades celcius depending on the region of the country.

-  **Hidrology.** Rivers are dry and have little caudals.


OUR OFFICIES

- 1. The National and Rational Energy Use Office (ONURE in Spanish). It belongs THE MINE AND ENERGY MINISTRY.**
- 2. Principal functions of our officies:** The ONURE is the reponsible of applying and controlling the policies and proyects regarding to the rational use of energy in our country.
- 3. The office has 525 workers, the 95 % are professionals and Technicians.**

THE ENERGY EFFICIENCY IN CUBA

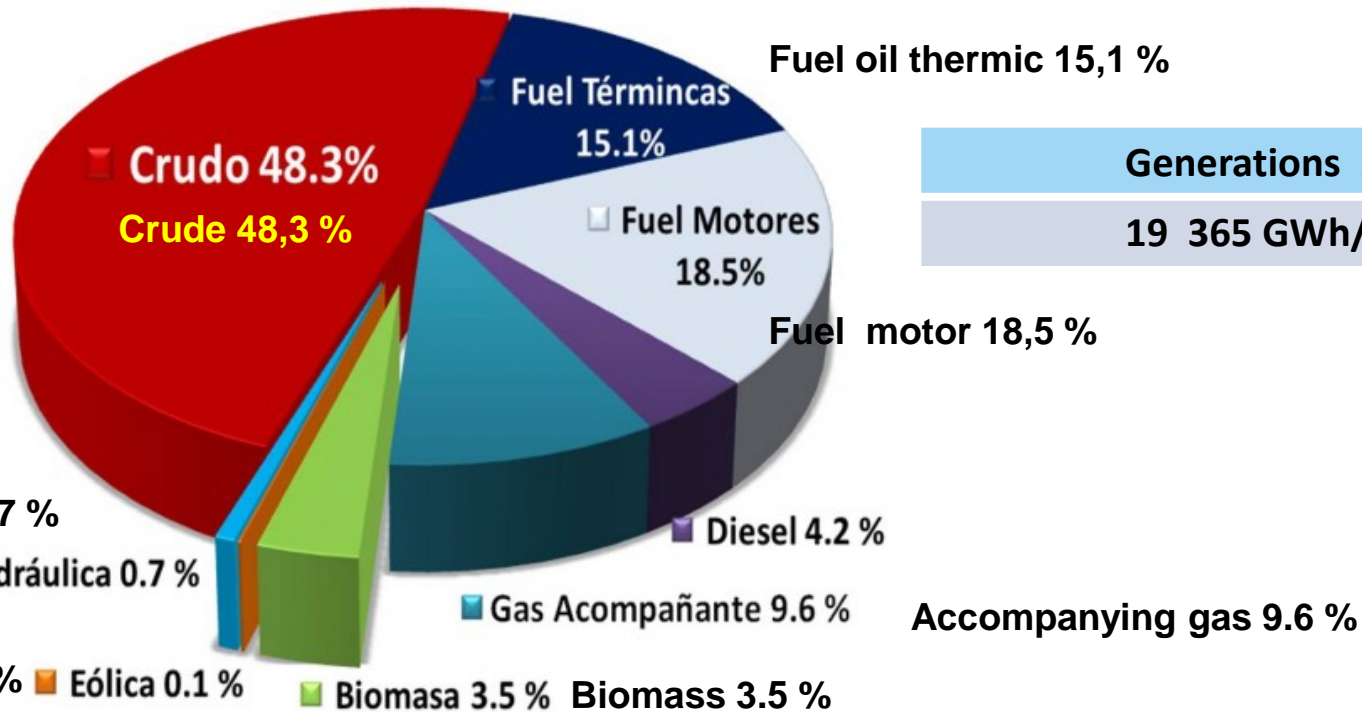
- ✓ **The Savin Electricity Program in Cuba was created in 1997. (PAEC in Spanish).**
- ✓ In 2005, Cuba applied The Program of Energy Revolution.
 - Changed **9,4 millions** incandescente Lightbulbs for Florescent compact lamps and **4,4 millions** inefficient electrical equipment households
 - **2,6 millions** of them were refrigerators.
 - Installed distributed generation with motors of high efficiency.
 - Electric rehabilitation of the grids.
 - Saving and rational use of Energy in the public sector, specifically high consumers.
 - Campaigns of divulgation to promote saving policies in population and with children at schools.

 **2 400 MW** distributed generation with motors of high efficiency are synchronized.

 They executed inspections to evaluate the efficient use of energy according to Cuban policies.



Energetic PRESENT-DAY matrix



Generations 2017

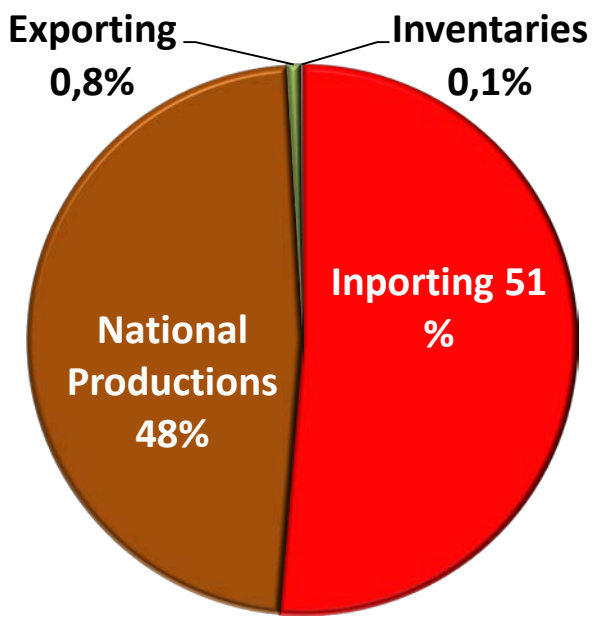
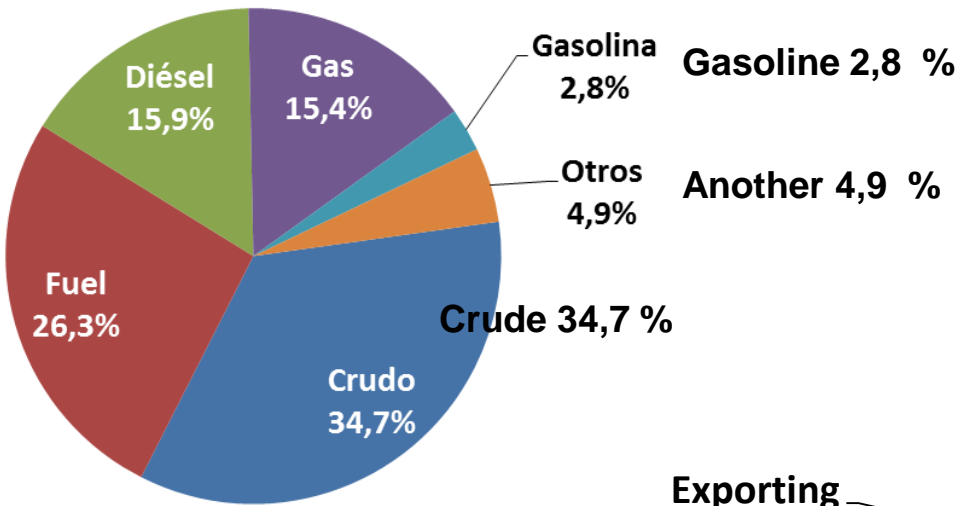
19 365 GWh/year

Only 4 % Generation with Renewable sources of Energy

- Today, Cuban economy sustains itself in two principal pillars: Services' sector: Exporting Services: Health and Tourism. Industrial Sector, where its principal industries are :
 - Mining (Ni)
 - Sugar bowl
 - Iron-and-steel (Steel Mills)

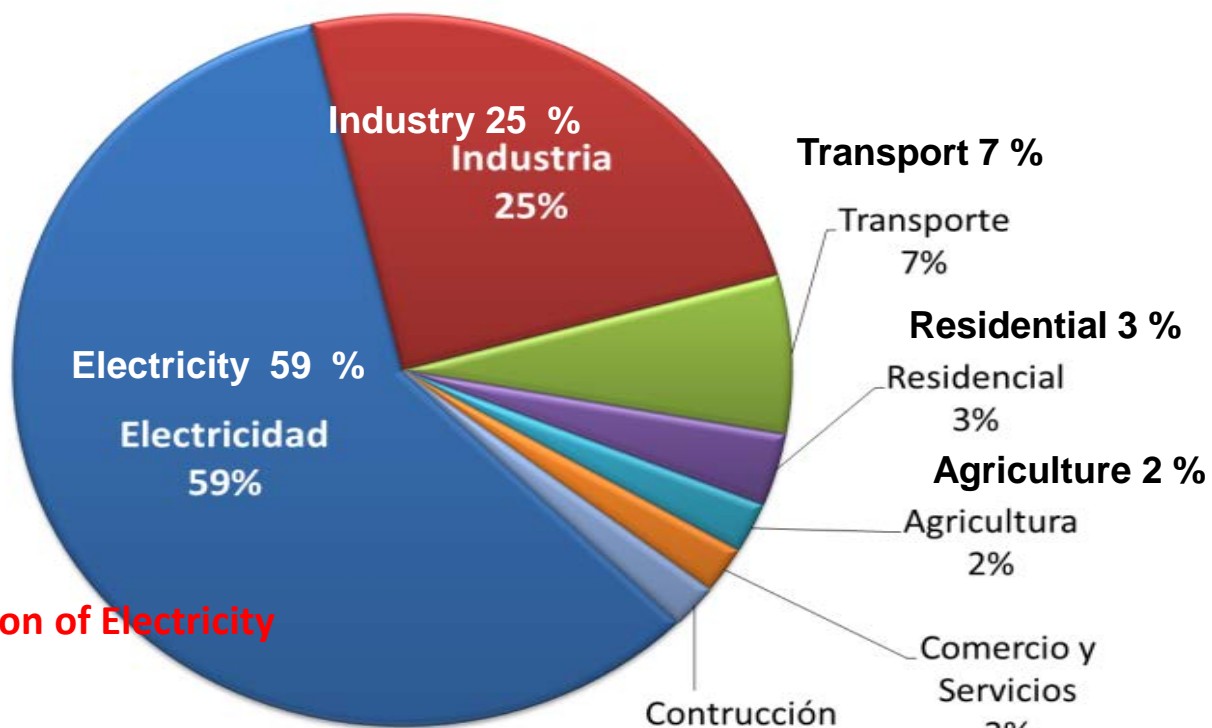
PRIMARY CONSUMPTION OF FUEL FOR SOURCE

Consumo de combustible

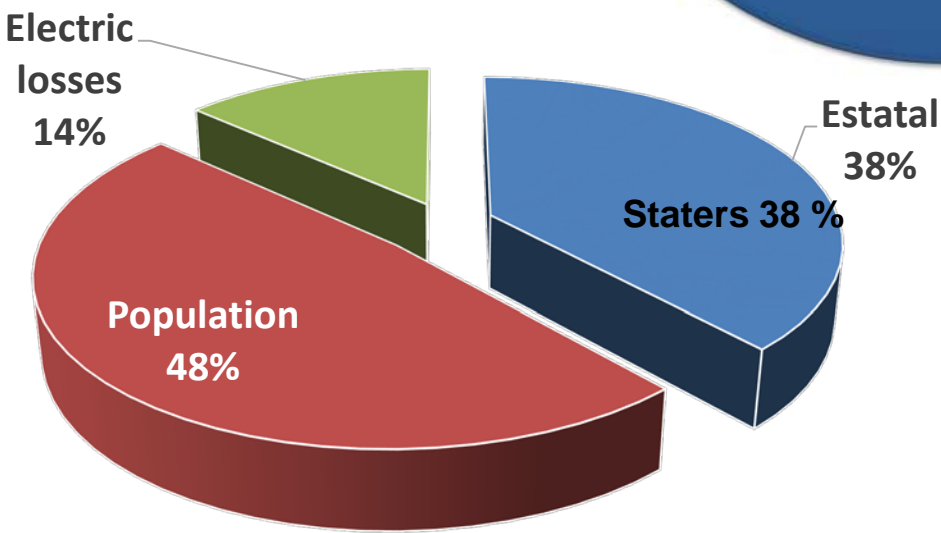


PRIMARY CONSUMPTION OF FUEL FOR SECTORS

Consumo de Combustible



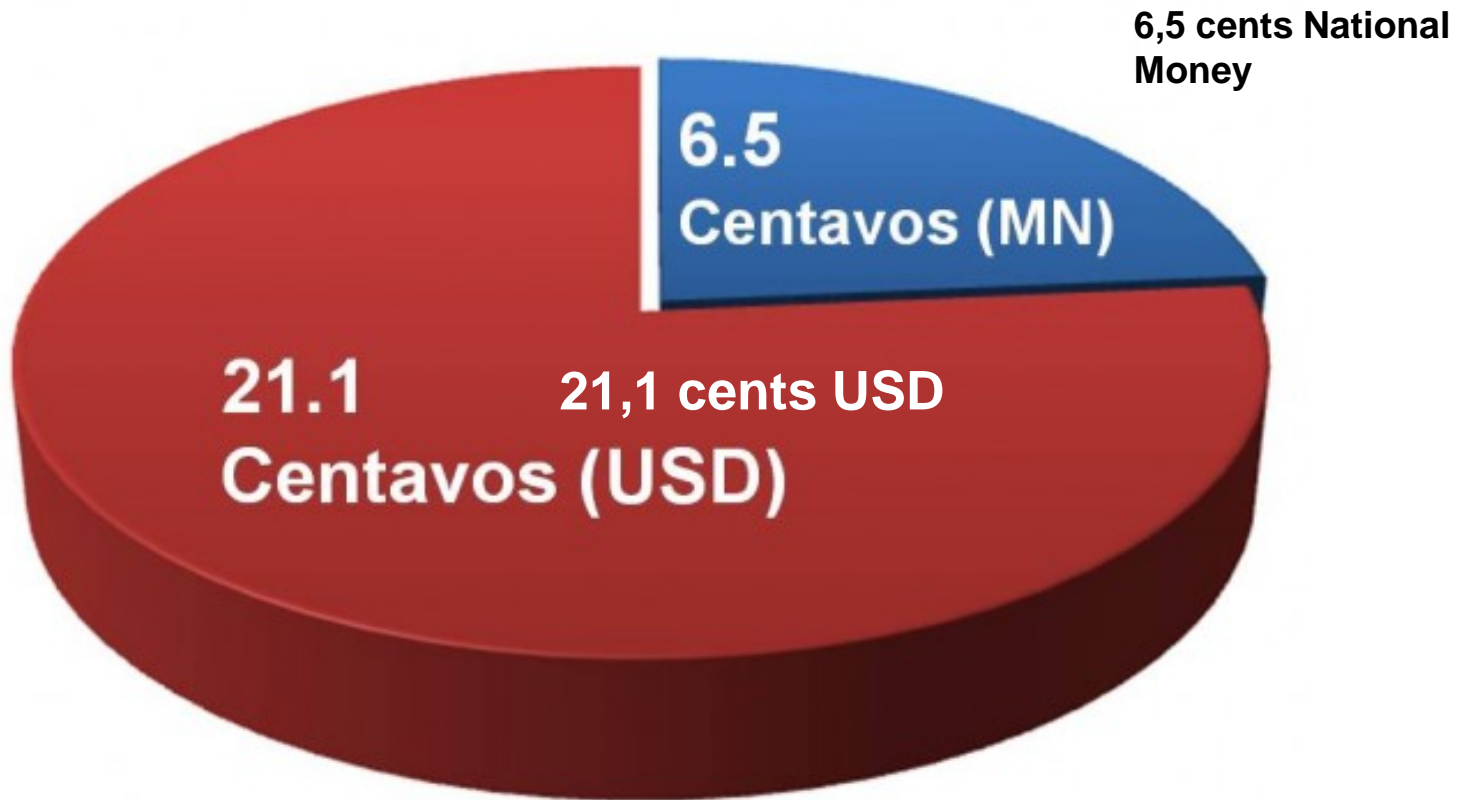
Structure of Consumption of Electricity



Construction 2 %
Trade and service 2 %

COST of kilowatt-hour once the CUSTOMER WAS TURNED IN

COSTO kWh ENTREGADO



FUTURE OF THE RENEWABLE SOURCES AND THE ENERGY EFFICIENCY

POLICY APPROVED FOR THE DEVELOPMENT OF THE RENEWABLE SOURCES And THE RATIONAL USE OF ENERGY

ACTIONS TO DEVELOP UNTIL 2030

INCREASE INSTALLED CAPABILITY FOR THE GENERATIONS WITH BIOMASS PIPE FITTER

INCREMENT IN 68 TIMES THE CAPABILITY INSTALLED FOR THE USE OF AEOLIAN ENERGY

INSTALLTION OF SMALL HYDROELECTRICS

13 Million LED LAMPS

2 UNITS OF 200 MW FOR GENERATIONS

INCREMENT IN 49 TIMES THE CAPABILITY FOR THE PHOTOVOLTAIC GENERATION

INCREMENT INDUSTRIAL PLANTS

MANUFACTURE OF 200 THOUSAND M2 SOLAR HEATING

2 MILLIONS INDUCTION KITCHENS

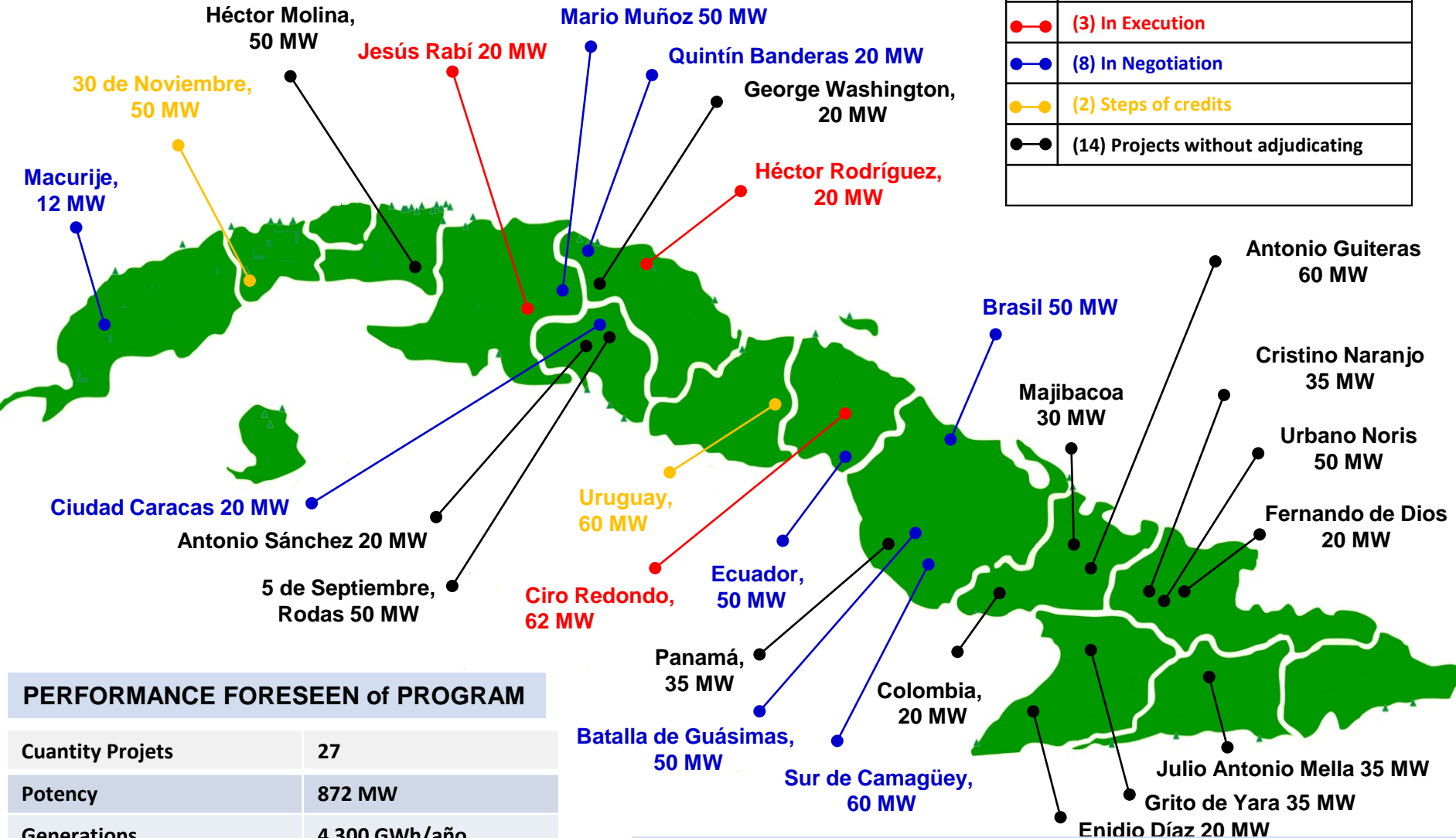
250 THOUSAND LED LAMPS IN AVENUES

DEVELOPMENT OF RENEWABLE SOURCES AND ENERGY EFFICENCY

Transformation of Matrix Energy with the participation of the renewable sources in the matrix energy will be 24,0 % in 2030.

Biomass

Legend	
	(57) In operation
	(3) In Execution
	(8) In Negotiation
	(2) Steps of credits
	(14) Projects without adjudicating



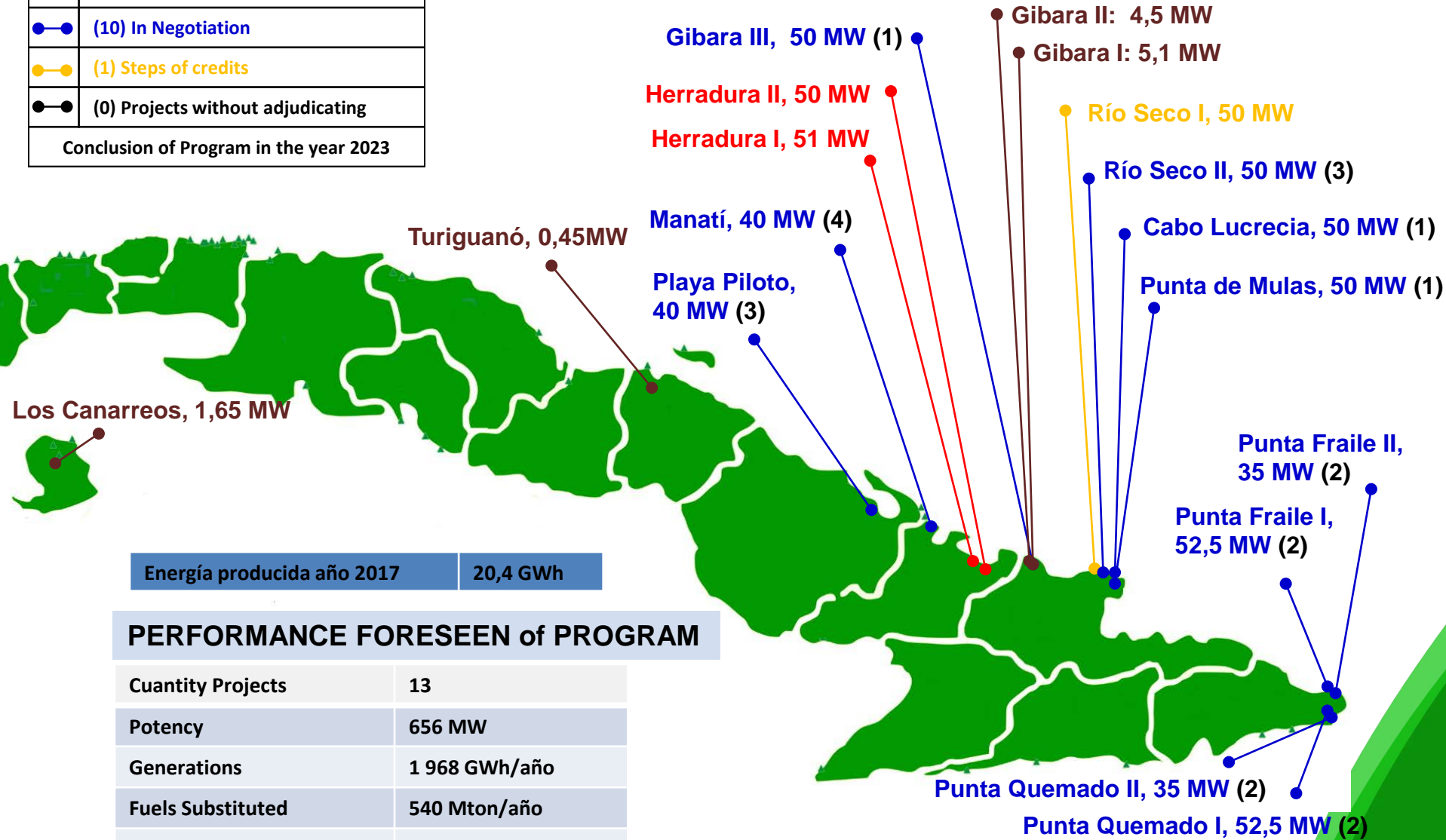
PERFORMANCE FORESEEN of PROGRAM	
Quantity Projets	27
Potency	872 MW
Generations	4 300 GWh/año
Fuels Substituted	960 Mton/año
Emissions avoided	3,65 MMton CO ₂ /año

14 Projects with 480 available MW'S potency in Opportunities's Wallet of Foreign Investment

Aeolian

Legend

	(4) In operation
	(2) In Execution
	(10) In Negotiation
	(1) Steps of credits
	(0) Projects without adjudicating
Conclusion of Program in the year 2023	

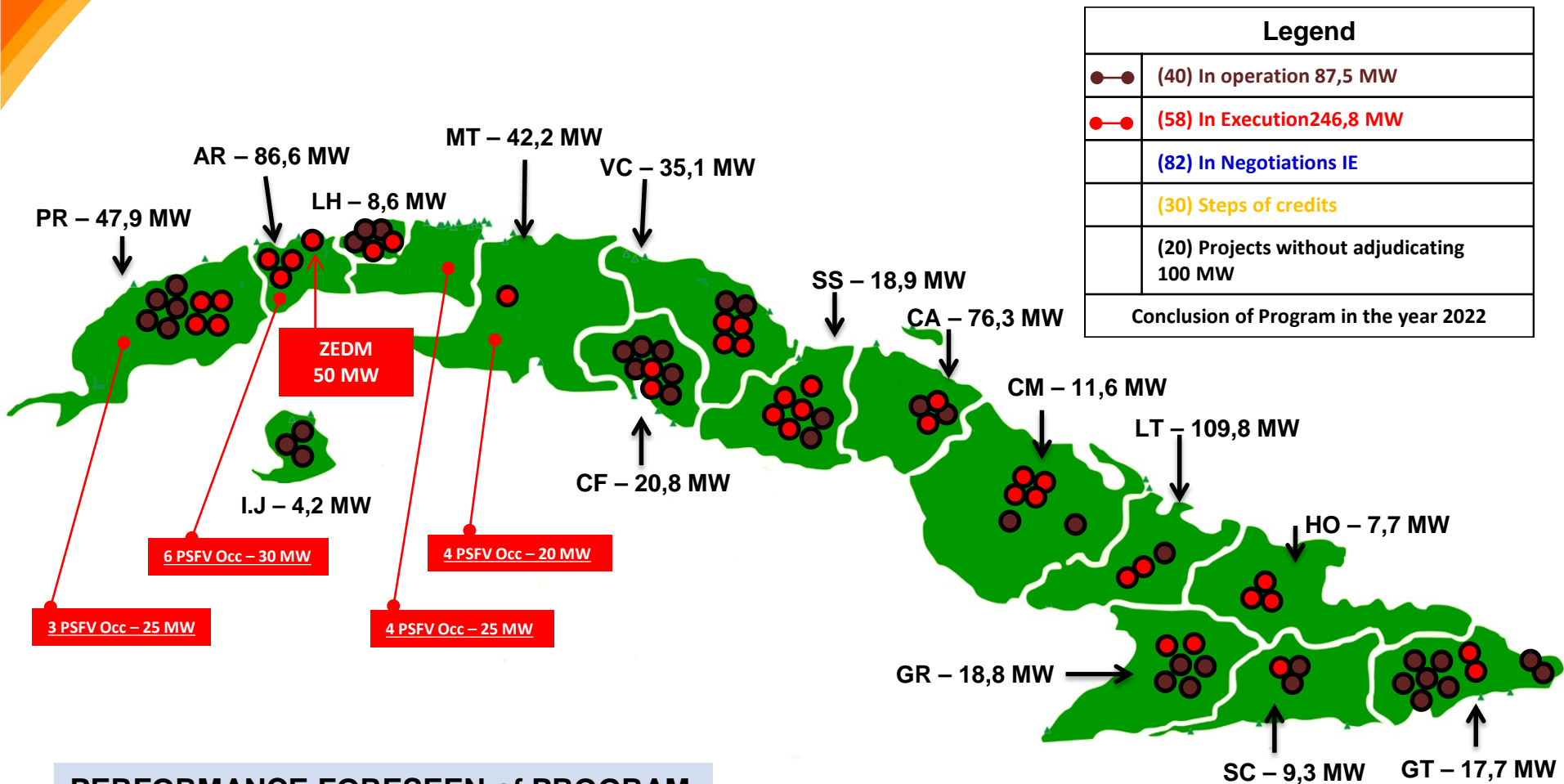


Energía producida año 2017 20,4 GWh

PERFORMANCE FORESEEN of PROGRAM

Quantity Projects	13
Potency	656 MW
Generations	1 968 GWh/año
Fuels Substituted	540 Mton/año
Emissions avoided	1,67 MMton CO ₂ /año

Soling Photovoltaic



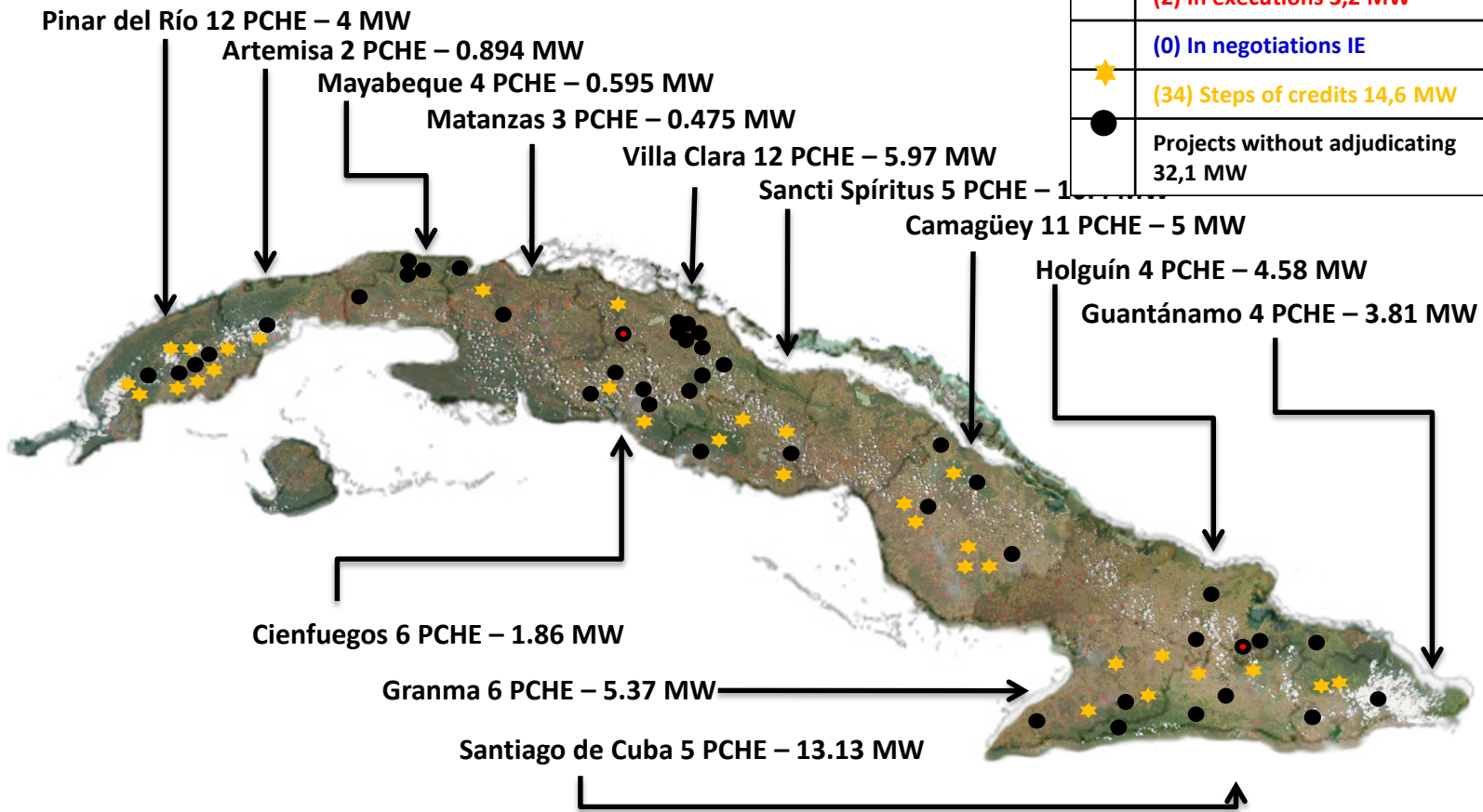
PERFORMANCE FORESEEN of PROGRAM

Quantity projects	210
Potency	700 MW
Generations	1 050 GWh/año
Fuels Substituted	240 Mton/año
Emissions avoided	0,89 MMton CO ₂ /año

40 PSFV – 87,5 MW (EN OPERACIÓN)
37 PSFV – 96,8 MW (2018)
21 PSFV – 150 MW Inv. – Ext. (2018)
103 PSFV – En Negociación
Terminación del Programa en el año 2022

HYDROELECTRIC

Legend	
	(161) In operation 65,2 MW
	(2) In executions 3,2 MW
	(0) In negotiations IE
	(34) Steps of credits 14,6 MW
	Projects without adjudicating 32,1 MW

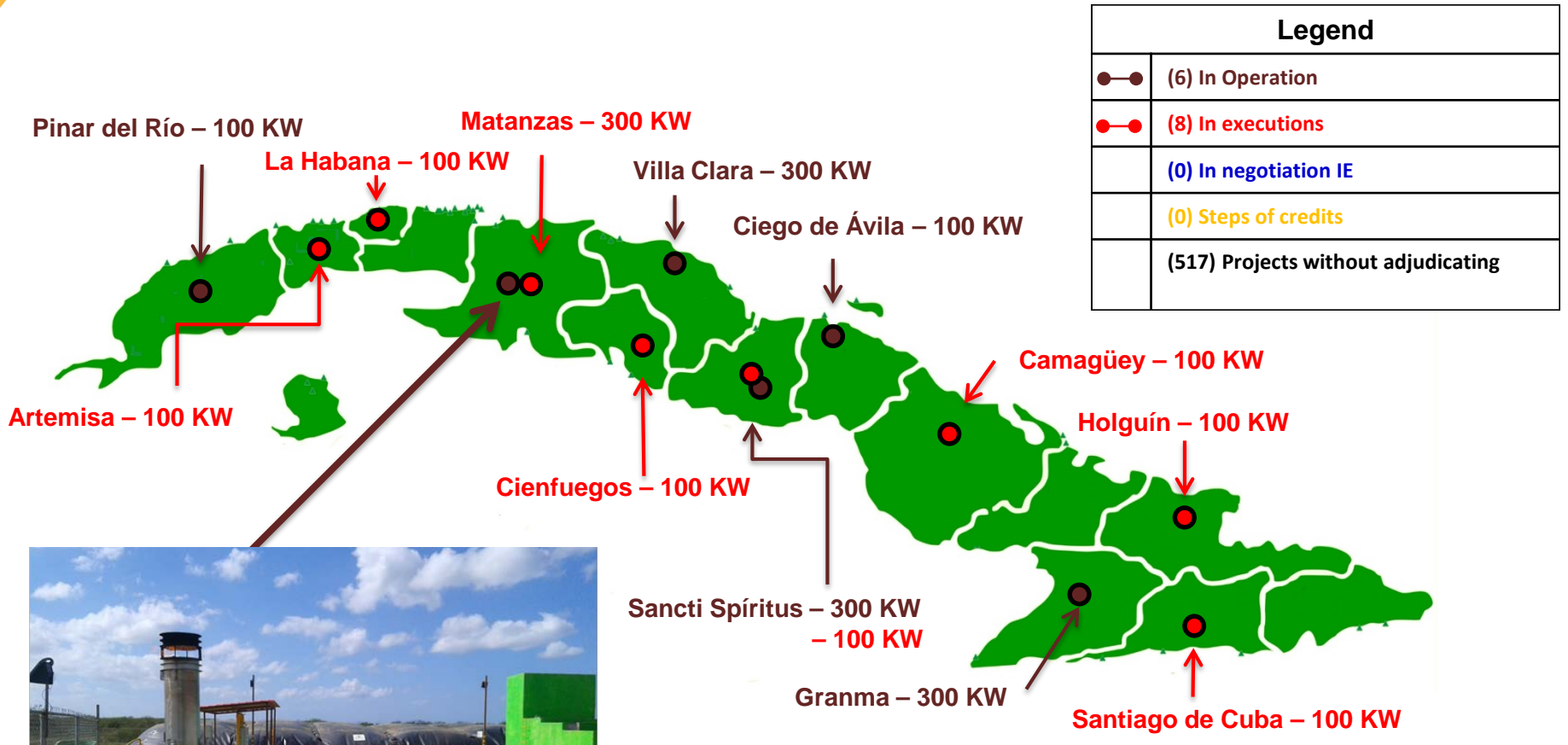


PERFORMANCE FORESEEN of PROGRAM

Potency	56 MW
Generations	350 GWh/año
Fuels sustituted	72 Mton/año
Emission avoided	0,297 MMton CO ₂ /año

38 MW Slopes of negotiation.

He stands up Industrials of Biogás



**Bio-digester Industrial Frank País
100 KW - Matanzas**

PERFORMANCE FORESEEN of PROGRAM

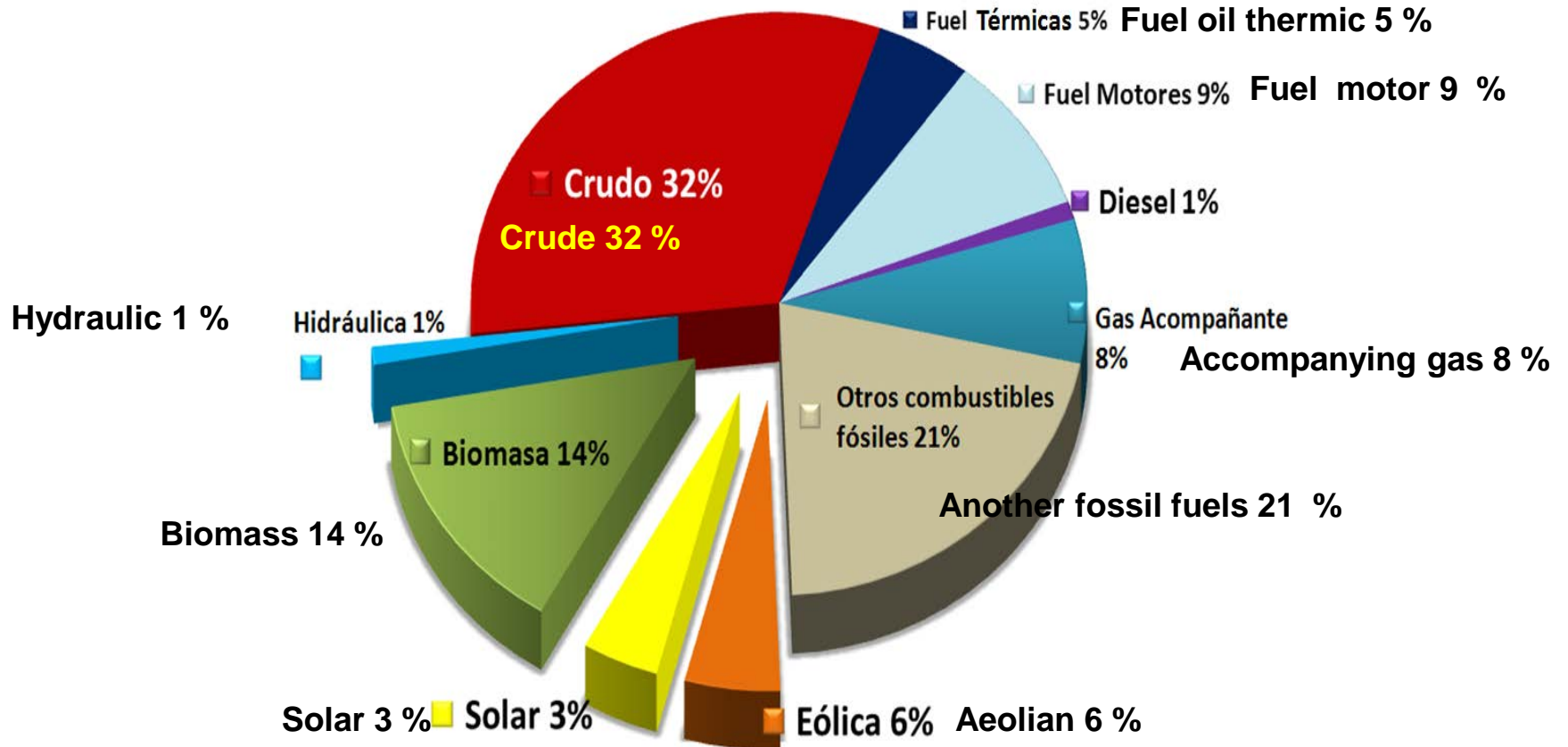
Quantity Projects	531
Potency	50 MW
Generations	57 GWh/año
Fuels substituted	15 Mton/año
Emissiones avoided	48 Mton CO ₂ /año

**517 projects with a
potency of 47,8 MW
Slopes of negotiation.**

STRUCTURES OF GENERATIONS OF ELECTRICITY IN 2030

Estimated Generation 2030

30 000 GWh/year



24% Generation with Renewable sources of Energy

POLICY APPROVED FOR THE DEVELOPMENT OF ENERGY EFFICIENCY

OBJETIVE: ACTIONS TO DEVELOP UNTIL 2030

13 MILLIONS OF
LED LAMPS

ENERGY
EFFICIENCY

2 UNITS 200 MW
FOR GENERATIONS

2 MILLION OF
INDUCTION
KITCHENS

200 MIL M2 SOLAR
HEATING

250 000 LED
LAMPS IN
AVENUES

FOCUSED ON THE INTRODUCTIONS OF EQUIMENTS AND
TECHNOLOGIES MORE EFFICIENT.

PROPOSAL OF EXPANSION OF POLICY APPROVED FOR THE RATIONAL USE OF ENERGY.

OBJETIVE: ESTABLISH LINES FOR THE DEVELOPMENT UNTIL 2030

EFFICIENT EQUIPMENT LINES

NORMALIZATION AND REGULATION OF ENERGETIC EFFICIENCY

ENERGY EFFICIENCY

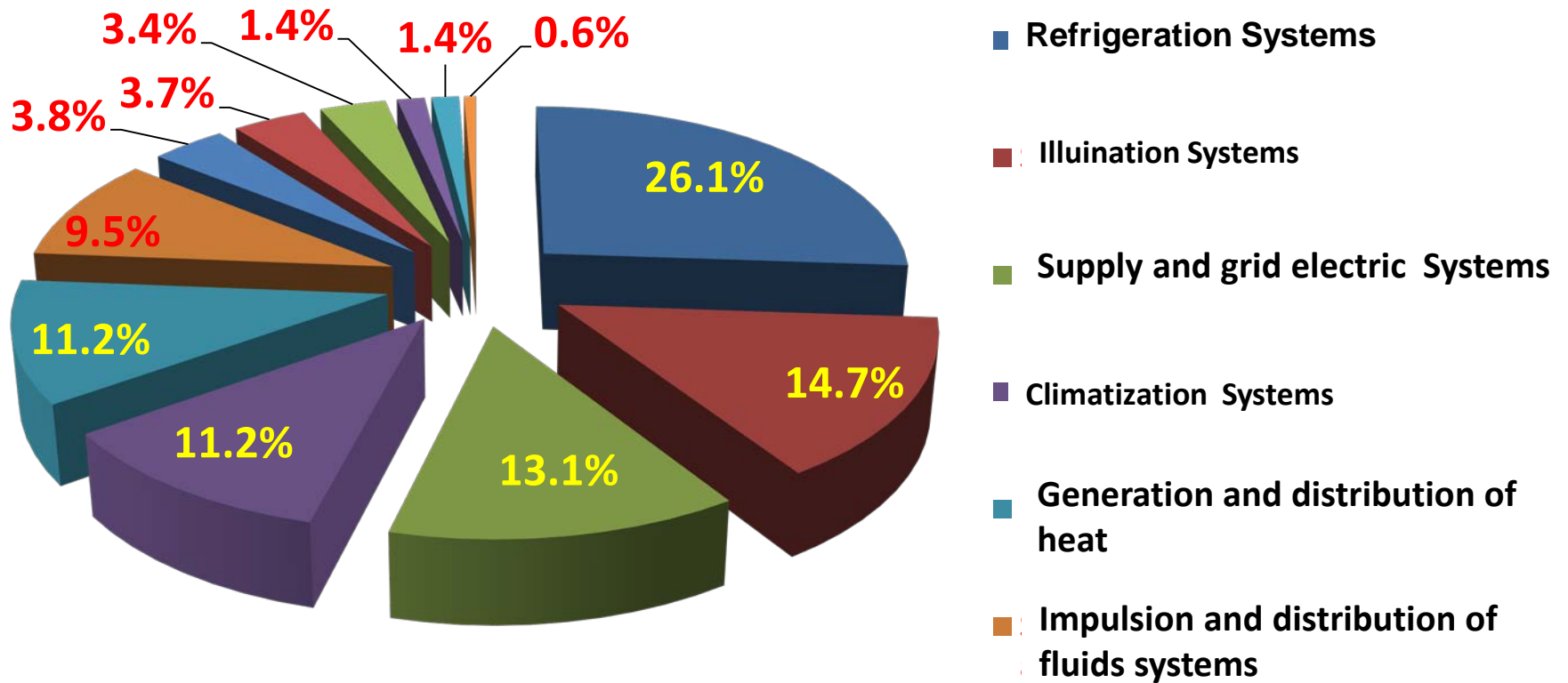
TECHNOLOGICAL SYSTEMS

MOTIVATION TO THE RATIONAL USE OF ENERGY.

FOCUSED ON THE DEVELOPMENT OF ENERGETIC EFFICIENCY FOR WORKING SPACES.

SAVING POTENTIALITIES FOR ENERGETIC SYSTEMS

% SAVING POTENTIALITIES FOR TECHNOLOGICAL SYSTEMS



PRESENT DAY REGULATORIES

- System of certification of products of final use of electric power Resolution 136/2009 MINEM
- Requirements of efficiency, energetic conservation and use of the sources of renewable energy for the approval of The Energetic license in the investor process . Decreto 327.
- Another Resolutions and Ministerial Orders.

THEMATIC LINES OF PROJECTS TO IMPLEMENT

1. Evaluación Energética's projects in the technological systems

- Steam-driven Generation
- Refrigeration and Climatization
- Illumination
- Motors of High efficiency
- To get better Potency Factors.
- Automatization

Exits: Formulation and Implementation of technical standards.

2. Projects of Energetic Evaluation on Buildings.

Exits: Bringing up to date, Formulation and Implementation of technical standards.

3. Regulations for the establishment of minimal standards of energetic efficiency in equipments of final use of energy.

Exits: Minimal standards, Methods of essays,

THEMATIC LINES OF PROJECTS TO IMPLEMENT

4. Behavior System Projects of Energy

Exits:

- Methodologies for the elaboration of energetic software
- Methodologies for the elaboration of energetic revisions
- Manuals of implementation of standards ISO 50001

5. Fabrication's projects of Heating Building Lots to local level.

Exits: Local development with small industries.

6. Projects of energetic evaluation for the investments

Exits: Bringing up to date of Methodology for the evaluation of investments

7. Feasibility of solar concentration in the industrial processes of steam-driven generation

THEMATIC LINES OF PROJECTS TO IMPLEMENT

8. Sale Projects of Heating Building Lots and Photovoltaic System to the residential sector.
9. Evaluation's and Substitution's projects of Technologies at the residential and Private Sector.

Exits: Proposal of change of technologies at the residential and private sector

PRINCIPAL PROBLEMS OF ENERGY

- 🤖 Financing for the development of projects
- 🤖 High dependence of fuels cared about for the generation.
- 🤖 High average cost of delivered energy .
- 🤖 High pollution.
- 🤖 Poor use of the renewable sources of energy.
- 🤖 Insufficient regulatory frame for the development of energetic efficiency.
- 🤖 Insufficient mechanisms of economic incentives to motivate the development of energetic efficiency.



! Thanks you !

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Cuba”**

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