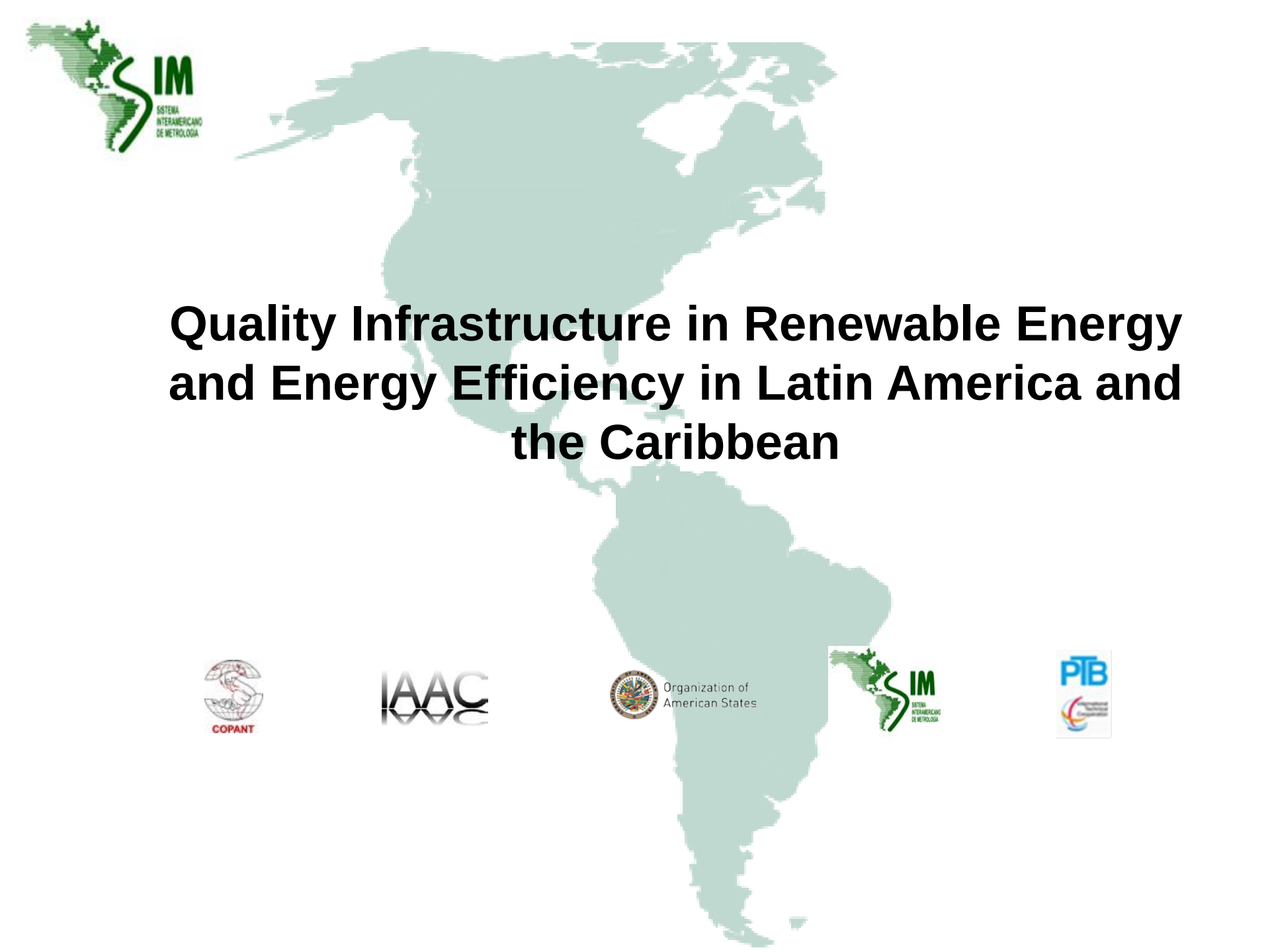
SIM Participation in Quality Infrastructure for Energy Efficiency and Renewable Energy Sources in Latin-America and the Caribbean – a PTB Project

Update on current activities in Argentina

Héctor Laiz
October, 2013

Quality Infrastructure in Renewable Energy and Energy Efficiency in Latin America and the Caribbean



OBJECTIVE

The objective of the project is to strengthen the capabilities of the regional organizations COPANT, IAAC and SIM and to improve technical competences in the region for the integration of renewable energy sources and to facilitate the implementation of energy efficiency programs

focus

- Quality assurance for solar thermal equipment for water heating,

- Build capacities to reduce technical losses in electricity grids and to prepare the grids to absorb renewable energy,

- Reliable determination and documentation (e.g. labeling) of the energy efficiency of household appliances,

- Increase awareness for the significant role of quality infrastructure in the utilization and promotion of renewable energy and energy efficiency.

Renewable Energies

Solar Water Heaters

Transmission & Distribution

(Smart) Grids

Transversal Awareness Building & Cooperation

Energy Efficiency

Household Appliances

DONE

Q5.Extranet: Project Activities

Example:

INTER-AMERICAN SYSTEM OF METROLOGY (SIM)

Traceability of measurement: An indispensable base for testing electrical household appliances. Current Status

Gregory Kyriazis, Daniel Cárcamo and Fernando Gómez

To Establish a Sound **Metrology Basis** for the Measurement of **Energy Efficiency of Electric Household Appliances** (EHA) in Latin America and Caribbean.

To define the **traceability chain** from EHA testing laboratories to National Metrology Institutes and/or Designated Institutes in Latin America and Caribbean.

TASK 1

Review the **written standards requirements** for testing the performance of electric household appliances.

We are particularly interested in the **quantities** to be measured, the **measuring instruments** required and their **accuracies**.

WRITTEN STANDARDS

Refrigerators / Freezers and associated compressors

NBR 12866, ISO 7371, IEC 62552 (cancels and replaces ISO 15502 which cancelled ISO 5155 and ISO 7371), EN 153, NBR 15826 , ISO 917, IEC/TR 61923, ISO/IEC Guide 43-1, ISO/IEC Guide 43-2, ISO/IEC Guide 46, ISO/IEC Guide 58, ISO 5725-1, ISO 5725-2, ISO 5725-3, ISO 5725-4, ISO 5725-5, ISO/TR 22971, IEC 60335-2-24

Washing Machines

IEC 60456, EN 50229, IEC 60704-1, IEC 60704-2-4, IEC 60734, IEC 61121:2002, IEC/TR 61592, IEC/TR 61923, IEC/TR 62617, IEC/PAS 62473, ISO 3759:2007, ISO 3801, ISO 4319:1977, DIN 53923, CIE No. 15.2: 1986, ISO/IEC Guide 43-1, ISO/IEC Guide 43-2, ISO/IEC Guide 46, ISO/IEC Guide 58, ISO 5725-1, ISO 5725-2, ISO 5725-3, ISO 5725-4, ISO 5725-5, ISO/TR 22971, IEC 60335-2-7

WRITTEN STANDARDS

Air Conditioners

ISO 5151, ISO 3966 , ISO 5167-1 , ISO/IEC Guide 98-3 , ISO 13253 , ISO 15042, ISO/IEC Guide 43-1, ISO/IEC Guide 43-2, ISO/IEC Guide 46, ISO/IEC Guide 58, ISO 5725-1, ISO 5725-2, ISO 5725-3, , ISO 5725-4, ISO 5725-5, ISO/TR 22971, IEC 60335-2-40

Lighting

CIE No. 15.2: 1986, ISO/IEC Guide 43-1, ISO/IEC Guide 43-2, ISO/IEC Guide 46, ISO/IEC Guide 58, ISO 5725-1, ISO 5725-2, ISO 5725-3, ISO 5725-4, ISO 5725-5, ISO/TR 22971, CIE 84

QUANTITIES TO BE MEASURED

Refrigerators / Freezers & Associated Compressors

Temperature
Pressure
Voltage
Current
Power
Refrigerant Flow
Cooling Water Flow
Speed
Mass

Time
Length (testing packages)
Mass (testing packages)
Torque
Humidity
linear dimensions
Volume
Electrical Energy

Washing Machines

Mass of conditioned base load (without test strips)
Mass of base load before each test run (without test strips)
Cold water consumption during main wash
Hot water consumption during main wash (if connected)
Total cold water consumption
Total hot water consumption (if connected)
Total electrical energy metered during the test
Ambient temperature
Laboratory supply water pressure cold
Laboratory supply water pressure hot (if connected)
Laboratory supply water total hardness cold
Laboratory supply water total hardness hot (if connected)
Laboratory supply cold water inlet temperature
Laboratory supply hot water inlet temperature (if connected)
Main wash duration
Programme time
Mass of base load after spin extraction
Mass of titration sample of tap water
Total amount of HCl 0.1N for tap water
Mass of titration sample of extracted water
Total amount of HCl 0.1N for extracted water
Reflectance after wash: Sebum
Reflectance after wash: Carbon black/Oil
Reflectance after wash: Blood
Reflectance after wash: Cocoa
Reflectance after wash: Red wine

Air Conditioners

Steady-state cooling and heating capacities determined using the calorimeter method
Heating and cooling capacities measured on the air side using the air enthalpy method
Water:

- Temperature
- Temperature difference
- Volume flow
- Static pressure difference

Air:

- Dry-bulb temperature
- Wet-bulb temperature
- Volume flow
- External static pressure difference

Voltage
Current
Power
Energy
Time
Mass
Speed
Refrigerant

Lighting

Temperature
Ac voltage
Dc voltage
Harmonic distortion
Ac current
Dc current
Power
Power factor
Luminous flux

TASK 2

Elaborate a listing of the accredited **testing laboratories** in Latin America and Caribbean that can test electric household appliances.

IAAC – Inter-American Accreditation Cooperation

http://www.iaac.org.mx/English/Members.php

TASK 3

Elaborate a listing of the accredited **calibration laboratories** in Latin America and Caribbean that can calibrate the measuring instruments and artifacts employed by the testing laboratories in their test of electric household appliances.

TASK 4

Elaborate a listing of the **National Metrology Institutes (NMI) and/or Designated Institutes (DI)** in Latin America and Caribbean that can calibrate the calibration laboratory standards related to the quantities involved in EHA testing.

Identify those **NMI and/or DI** which have Calibration and Measurement Capabilities (CMC) published in the JCRB CMC database.

NMIs and DIs with CMCs Published on Electricity and Magnetism (AC Quantities)

Argentina - INTI – Instituto Nacional de Tecnología Industrial

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Chile - LCPN-ME/UDEC - Laboratorio Custodio Patrón Nacional de Magnitudes Eléctricas de la Universidad de Concepción.

Costa Rica - ICE – Instituto Costarricense de Electricidad

Panama - CENAMEP – Centro Nacional de Metrología de Panamá

Peru - INDECOPI – Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual

Mexico - CENAM – Centro Nacional de Metrología

Uruguay - UTE – Administración Nacional de Usinas y Trasmisiones Eléctricas

NMIs and DIs with CMCs Published on Electricity and Magnetism (DC Quantities)

Argentina - INTI – Instituto Nacional de Tecnología Industrial

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Chile - LCPN-ME/UDEC - Laboratorio Custodio Patrón Nacional de Magnitudes Eléctricas de la Universidad de Concepción.

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Mexico - CENAM – Centro Nacional de Metrología

Uruguay - UTE – Administración Nacional de Usinas y Trasmisiones Eléctricas

NMIs and DIs with CMCs Published on Mass

Argentina - INTI – Instituto Nacional de Tecnología Industrial

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Chile - CESMEC S.A. – Centro de Estudios de Medición y Certificación de Calidad

Costa Rica - LACOMET – Laboratorio Costarricense de Metrología

Ecuador – INEN – Instituto Ecuatoriano de Normalización

Jamaica - BSJ – The Bureau of Standards Jamaica

Panama - CENAMEP – Centro Nacional de Metrología de Panamá

Paraguay – INTN – Instituto Nacional de Tecnología, Normalización e Metrología

Peru - INDECOPI – Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual

Mexico - CENAM – Centro Nacional de Metrología

Uruguay - LATU – Laboratorio Tecnológico del Uruguay

NMIs and DIs with CMCs Published on Pressure

Argentina - INTI – Instituto Nacional de Tecnología Industrial

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Mexico - CENAM – Centro Nacional de Metrología

NMIs and DIs with CMCs Published on Temperature

Argentina - INTI – Instituto Nacional de Tecnología Industrial

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Chile - CESMEC S.A. – Centro de Estudios de Medición y Certificación de Calidad

Costa Rica - LACOMET – Laboratorio Costarricense de Metrología

Peru - INDECOPI – Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual

Mexico - CENAM – Centro Nacional de Metrología

Uruguay - LATU – Laboratorio Tecnológico del Uruguay

NMIs and DIs with CMCs Published on Torque

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Mexico - CENAM – Centro Nacional de Metrología

NMIs and DIs with CMCs Published on Volume of Liquids

Argentina - INTI – Instituto Nacional de Tecnología Industrial

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Mexico - CENAM – Centro Nacional de Metrología

NMIs and DIs with CMCs Published on Fluid Flow

Mexico - CENAM – Centro Nacional de Metrología

NMIs and DIs with CMCs Published on Luminous Flux

Argentina - INTI – Instituto Nacional de Tecnología Industrial

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Mexico - CENAM – Centro Nacional de Metrología

NMIs and DIs with CMCs Published on Humidity

No NMIs / countries.

NMIs and DIs with CMCs Published on Chemistry

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Mexico - CENAM – Centro Nacional de Metrología

NMIs and DIs with CMCs Published on Length

Argentina - INTI – Instituto Nacional de Tecnología Industrial

Brazil - Inmetro – Instituto Nacional de Metrologia, Qualidade e Tecnologia

Chile - Ingeniería DICTUC S.A. – Dirección de Investigaciones Científicas y Tecnológicas de la Pontificia Universidad Católica de Chile

Mexico - CENAM – Centro Nacional de Metrología

Peru - INDECOPI – Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual

2013	Solar Water Heaters	Household Appliances	Grids	Transversal: Awareness
Standardization	Program to support small NSBs to paraticipate in international Stdzn (mirror committee formation) 2013			Information Material on the benefits of QI for SWH (Oct) Impact studies (starting Nov. IRENA?) Satellite events to existing ones (IAAC GA – Aug.) QI-Contributions to meetings of reg. Organizations OLADE – May, CEPAL – Nov., OAS - Nov.)
	Exchange of experience: Labeling Best Practice, (July) with regulators and corresponding follow up (pilot awareness seminars)			
Accreditation	Capacity Building: Inspection Bodies (June) Certification Bodies (TBD) Peer Evaluators (May)			
		PT (Fridges) (2013)		
Metrology	Determine demand for metrological back up		Training on Power Quality (Sept.)	
	Building capacities in Solar Radiation Thermal properties of materials Preparation of Intercomparisons	Capacity Builiding Energy Meter Verification – follow up to 2012 Training Seminar on Basic Elements for Energy Meter Verification (Nov.)		

Ministerio de Industria
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INTI

Renewable Energy and Climate Science Activities at INTI

SOLAR

- Test facilities for solar water heaters.
- Consultancy
- Proyect “Solar energy for social house projects”
- New test facilities fotovoltaic panels

EOLIC

- Test facilities for low power generator (Neuquén)
- New facilities for high power generator

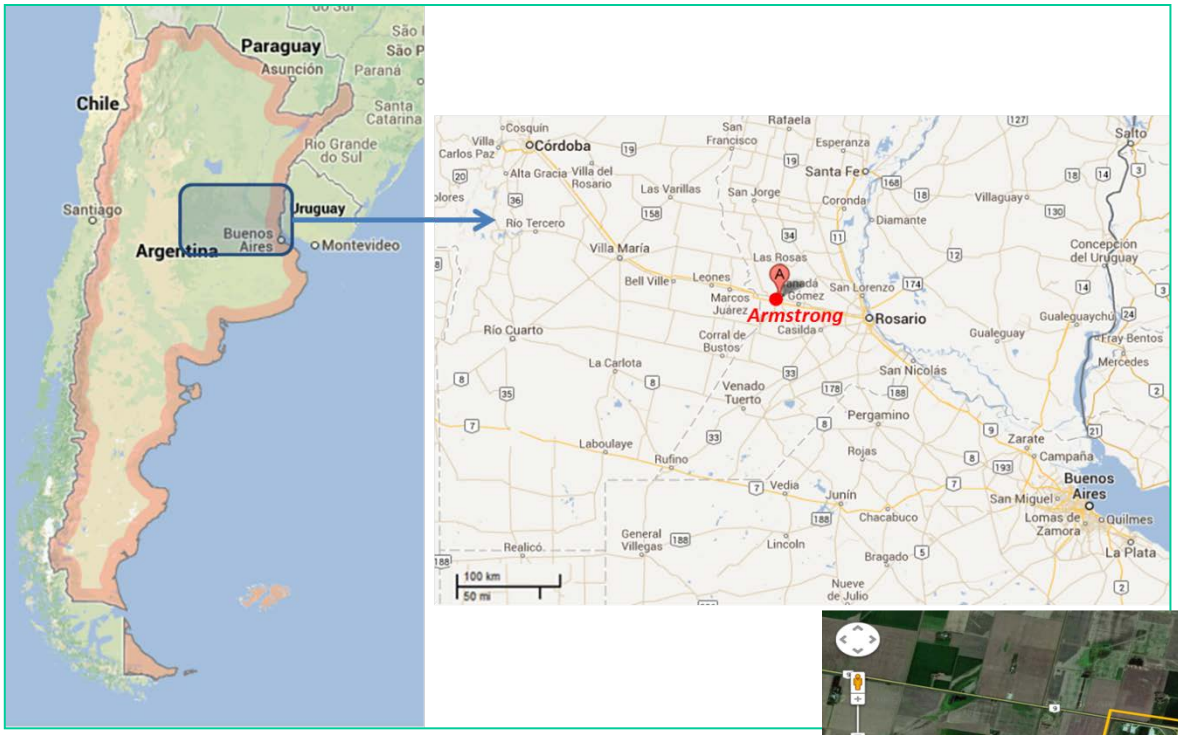
BIOGAS

BIOMASSA

Wood and other agricultural wastes

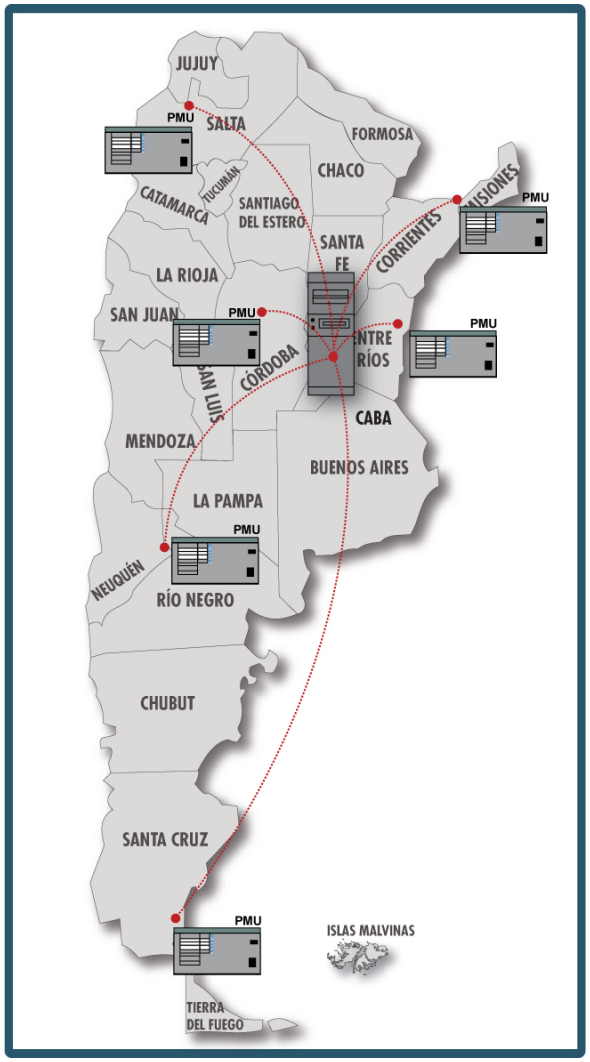
ENERGY FROM SOLID URBAN WASTE

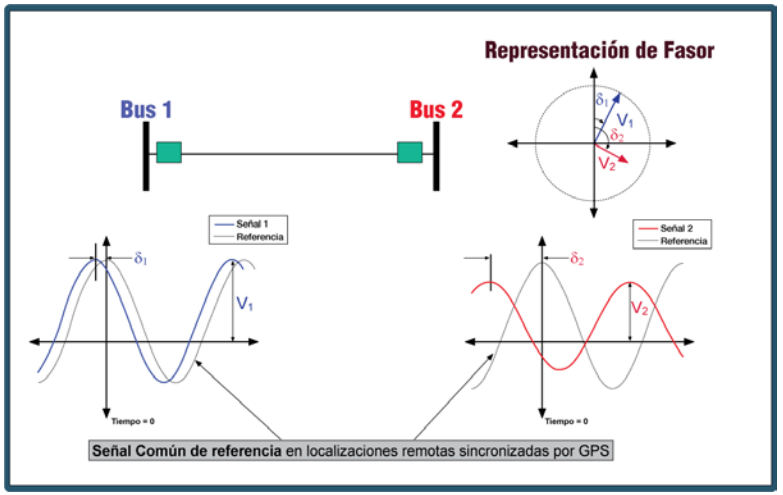
SMART GRIDS

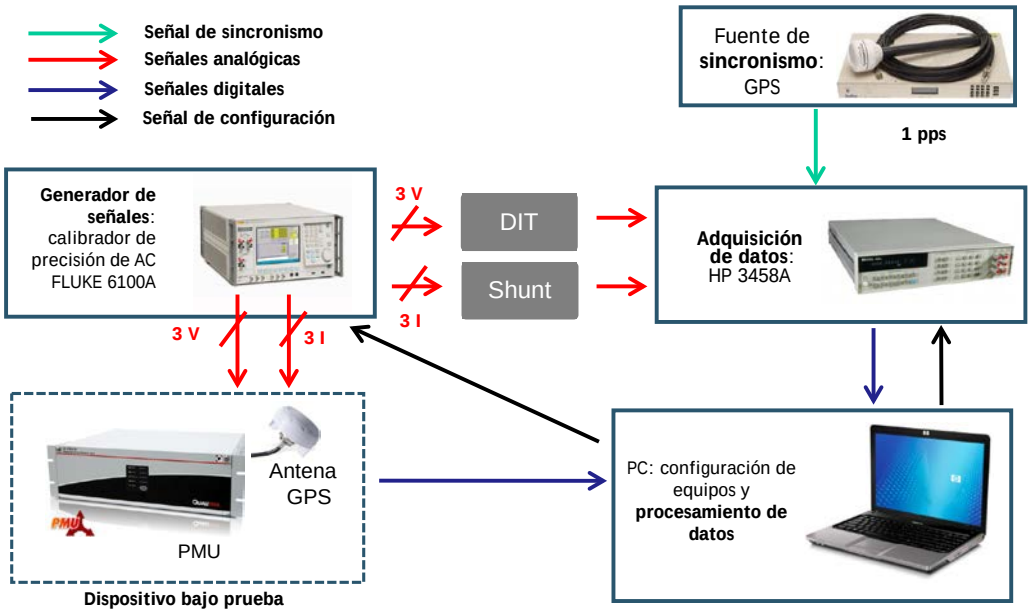

Paraguay
Asunción
Chile
Santiago
Uruguay
Buenos Aires
Argentina
Montevideo
Córdoba
Santa Fe
Rosario
Armstrong
Río Tercero
Río Cuarto
Villa María
Bell Ville
Marcos Juárez
Las Rosas
San Lorenzo
Casilda
Corral de Bustos
La Carlota
Venado Tuerto
Pergamino
Rojas
Zarate
Campana
San Nicolás
Junín
Chacabuco
Lincoln
Bragado
Laboulaye
Rufino
Realicó
General Villegas
Nueve de Julio
Gualeguay
Gualeguaychú
Concepción del Uruguay
Salto
Villaguay
Diamante
Coronda
Las Varillas
San Jorge
Esperanza
San Francisco
Rafaela
Cosquín
Villa Carlos Paz
Alta Gracia
Villa del Rosario
Mercedes
Fray Bentos
Buenos Aires
San Miguel
Lomas de Zamora
Quilmes
La Plata
100 km
50 mi


Doble terna 33 kV
Interconexión con EPE
Parque Industrial
ET Armstrong
Centro Comercial / Residencial
Nuevo barrio residencial
Autopista Rosario - Córdoba
1 km
2000 pies

PMUs


JUJUY
SALTA
PMU
FORMOSA
CHACO
CATAMARCA
TUCUMÁN
SANTIAGO DEL ESTERO
MISIONES
PMU
CORRIENTES
SANTA FE
LA RIOJA
SAN JUAN
PMU
ENTRE RÍOS
PMU
CÓRDOBA
SAN LUIS
CABA
MENDOZA
BUENOS AIRES
LA PAMPA
PMU
NEUQUÉN
RÍO NEGRO
CHUBUT
SANTA CRUZ
PMU
ISLAS MALVINAS
TIERRA DEL FUEGO


Representación de Fasor
Bus 1
Bus 2
Señal 1
Referencia
Señal 2
Referencia
Tiempo = 0
Tiempo = 0
Señal Común de referencia en localizaciones remotas sincronizadas por GPS


Señal de sincronismo
Señales analógicas
Señales digitales
Señal de configuración
Fuente de sincronismo: GPS
1 pps
Generador de señales: calibrador de precisión de AC FLUKE 6100A
3 V
3 I
DIT
Shunt
Adquisición de datos: HP 3458A
3 V
3 I
Antena GPS
PMU
Dispositivo bajo prueba
PC: configuración de equipos y procesamiento de datos

Climate Change

The Secretary of Environment and Sustainable Development created the **Governmental Committee for Climate Change**.

2. CNAE. Comisión Nacional de Actividades Espaciales.
3. CNEA. Comisión Nacional de Energía Atómica.
4. COFEMA. Consejo Federal de Medio Ambiente.
5. COHIFE. Consejo Hídrico Federal.
6. INA. Instituto Nacional de Agua
7. INTA. Instituto Nacional de Tecnología Agropecuaria
8. INTI. Instituto Nacional de Tecnología Industrial.
9. Ministerio Ciencia, Tecnología e Innovación Productiva.
10. Ministerio de Agricultura, ganadería y pesca. *Secretaria de Agricultura*.
11. Ministerio de Desarrollo Social. *Secretaría de Economía Social*.
12. *Secretaria de Comercio Exterior. Dirección Nacional de Política Comercial Externa*.
13. Ministerio de Economía: *Secretaría de Política Económica.*
14. Ministerio de Educación.
15. Ministerio de Industria. *Secretaria de Industria*.
16. *Subsecretaría de Recursos Hídricos*.
17. *Secretaria de Energía*
18. *Secretaría de Transporte.*
19. *Subsecretaría de planificación territorial de la Inversión Publica*.
20. *Dirección Gral. De Asuntos Ambientales.*
21. *Secretaría de Determinantes de salud y Relaciones Sanitarias.*
22. Ministerio de Trabajo.
23. Ministerio de Turismo.
24. Ministerio del Interior. *Secretaría de Provincias*.
25. SAYDS. Secretaría de Ambiente y Desarrollo Sustentable.
26. Servicio Meteorológico Nacional.

Actions to improve the efficiency of production processes in terms of GHG

1. Energy Efficiency

2. Promote clean production processes

3. Promote recycling and reuse on industrial waste.

4. Foster de use of alternative fuels.

5. Consider the concept of climate change in the environmental impact analysis and in the baseline studies.

6. To Promote the development of technological clusters for the production of environmental friendly technologies

Projects in which INTI is involve

- Consultancy to reduce the energy consumption in industrial processes. Program of energy management in accordance to ISO 50001

- **National Plan for Science, Technology and innovation.** Open call for projects on alternative energies: Solar, Eolic, biomass, biofuels

- **MERCOSUR. Project ECONORMAS** "Support to the Economic Integration and Sustainable Development" line 1. Promotion of the sustainable production (PCS).

- **BID 1865** – Subprogram I. Promotion of Clean Production in industrial sectors. INTI and SAyDS

- **Cooperation with the Japan** (Ministry of Environment) for the evaluation of the reduction of GHG emissions . Measurement, report and validation of the reductions of emissions in accordance to ISO 14064 and 14065

Projects in which INTI is involve

-Cogeneration of heat and electricity in small and medium size industries, including the uses of industrial waste

-Technology for the use of solid urban waste and agro-industrial waste

Measurement of GHG

Characterization of emissions from industrial processes that use fossil fuels. Infrared Cell to measure the CO_2 concentration

Characterization of emission from waste fill lands and biodigestors. Carbon dioxide and methane

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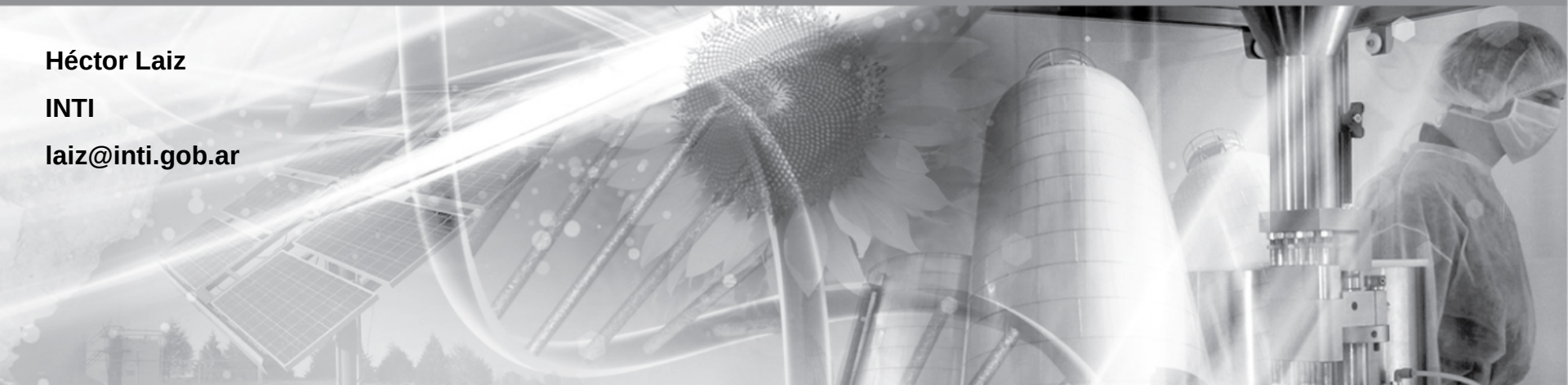
Muchas Gracias



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