

Monitoreando el progreso hacia la transición energética en ALC

El rol de las Estadísticas e Indicadores Energéticos



NACIONES UNIDAS
UNITED NATIONS



United Nations Economic Commission for LAC

Regional Observatory on Sustainable Energies -ROSE



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11 de noviembre, 2019

UN-ECLAC: fundamental areas of intervention on Energy

1. Changing the energy matrix towards a more sustainable and efficient one
2. Universal access to sustainable energy and quality energy services, key to equality and social inclusion
3. Energy as an engine of structural change and increased productivity (energy policies and investments linked to other sectors - Environmental Big Push)
4. NEXUS

How does ECLAC define Energy Transition in Latin America and the Caribbean?

Energy transition will be understood as the **process of change** in **policies, institutions, regulations** and **investments** that promote the generation and more sustainable uses of energy aiming at the decarbonization of the economy, prioritizing:

- **More generation** of electricity from **renewable sources**, with an emphasis on variable renewables.
- **More energy efficiency** of energy systems, including transport.
- **More sustainable management** of **fossil** fuels and biofuels
- **More energy complementarity** leading to less regional energy vulnerability

Objective: Decarbonization

Strategy: Energy Transition

Instrument: Environmental Big Push



CEPAL



- Are the existing indicators comprehensive, robust and comparable?
- How the existing indicators can be improved?
- Role of regional cooperation and knowledge sharing.....???? How we can coordinate and harmonize Energy Data Processing, Assumptions among all the custodians: WB, IRENA, IEA, ?.. International Recommendations for Energy Statistics are not fully applied?

People without acces to electricity in 2017??

12 million people WB and 18 Million OLADE, sieLAC

Devil is in Detail: Need for Disaggregation

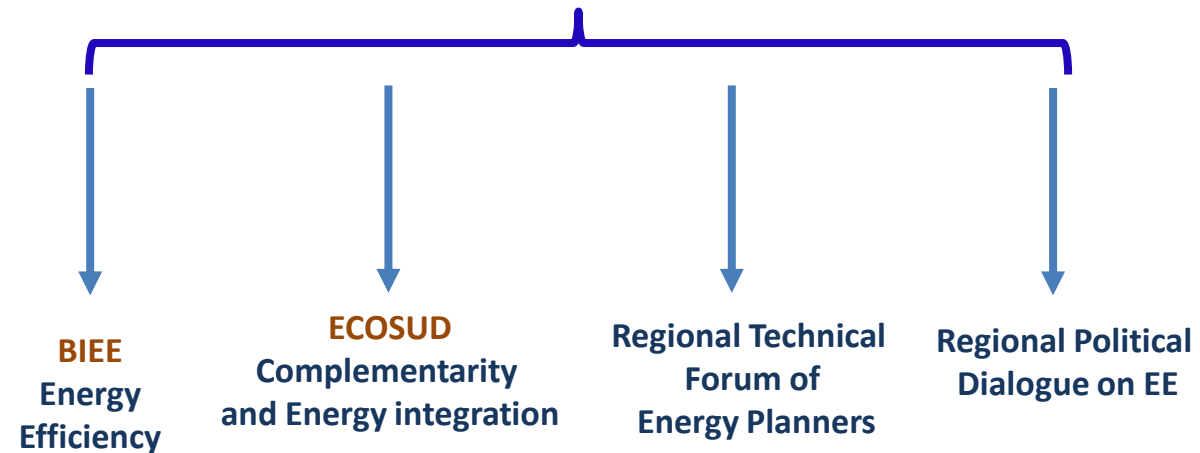
- Energy access: share of population with access
➔ **Improvement:** Access Quality?, Impact on the poorest sectors?, detailed share of rural and urban population
- Renewable energy share in final energy
➔ **Improvement:** RE in heat, electricity, mobility, End-of-Life of RE technologies
- Energy intensity: primary energy per GDP
➔ **Improvement:** Detailed sectoral tracking (households, industry, transport)
➔ **Challenge:** Considering the heterogeneity between countries (climate, economic structure, etc.)

ECLAC Project: The Regional Observatory on Sustainable Energies (ROSE)



Regional Observatory on Sustainable Energies (ROSE)

Energy Data in the form of Energy Indicators, modeling and Technical Cooperation



Objectives of the "Regional Observatory on Sustainable Energy"

General objective:

To strengthen the national capacities of all Member States in Latin America and the Caribbean to design, implement and monitor sustainable energy strategies, plans and policies based on objective evidence.

Specific objectives:

1 Strengthen the technical capacities of beneficiary countries to produce relevant and consistent data (e.g. social changes in access) to develop energy indicators.

2 Improve the capacity of beneficiary countries to design and implement evidence-based policies and action plans on sustainable energy.

One of ROSE's actions is to create spaces for political-technical dialogue in the region to promote efforts to achieve Agenda 2030 and SDG7.

REGIONAL TECHNICAL FORUM OF ENERGY PLANNERS

Reunión preparatoria del Foro - Río de Janeiro, EPE – marzo 6, 2018



1er Foro Técnico de Planificadores Energéticos – Bogotá, Ministerio de Energía y Minas de Colombia, 5-junio-2018



2do Foro Técnico de Planificadores Energéticos – Santiago en CEPAL, 30 octubre 2018

Just held - 3er Foro Técnico de Planificadores Energéticos – Lima, Perú – 23 Octubre 2019

Energy Efficiency Indicators Database for LAC



BIEE - Base de Indicadores de Eficiencia Energética



English | Spanish

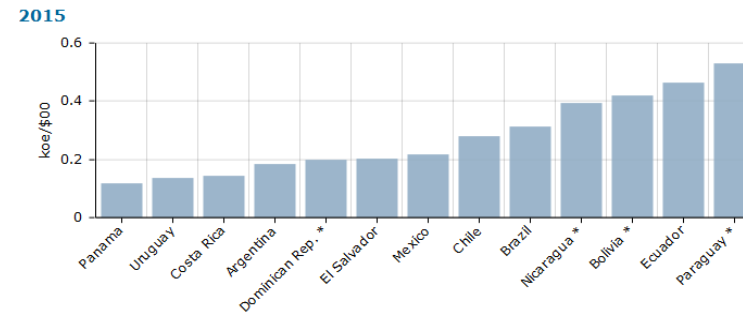


- Global indicators
- Power sector
- Industry
- Transport
- Households
- Services
- Agriculture

Primary energy intensity at exchange rate



Primary energy intensities in \$ at exchange rates vary significantly among countries



The primary energy intensity in US\$ is the ratio between the total energy consumption of a country and its Gross Domestic Product (GDP) measured at 2 000 prices and exchange rates. It measures the total amount of energy necessary to generate one unit of GDP. Energy intensities should only be compared at purchasing power parities as they consider the real level of economic activity, which narrows significantly the differences across countries.

Advanced indicators

* The update until 2015 is not available for these countries.

Source BIEE

Data-Mapper: sitio Web de la Base de datos para elaboración de Indicadores en EE

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Sitio Web: <https://www.cepal.org/es/proyectos/programa-biee-base-de-indicadores-de-eficiencia-energetica>

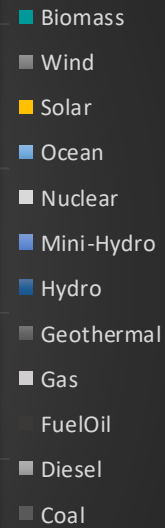
Base de datos 'Data-Mapper': <http://www.biee-cepal.enerdata.eu/>



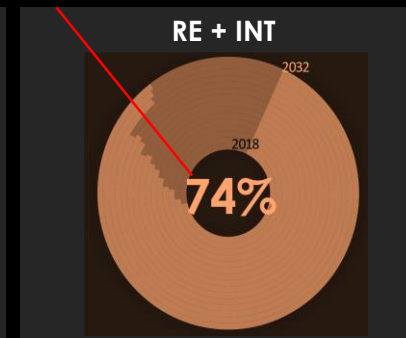
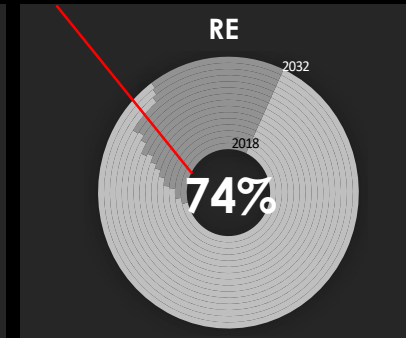
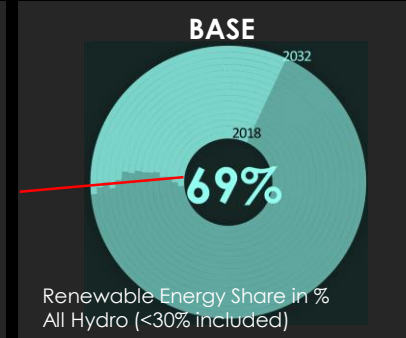
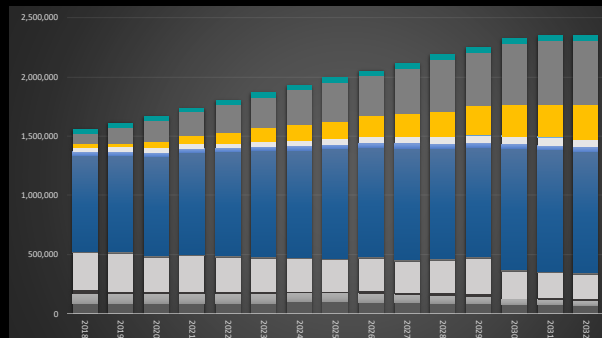
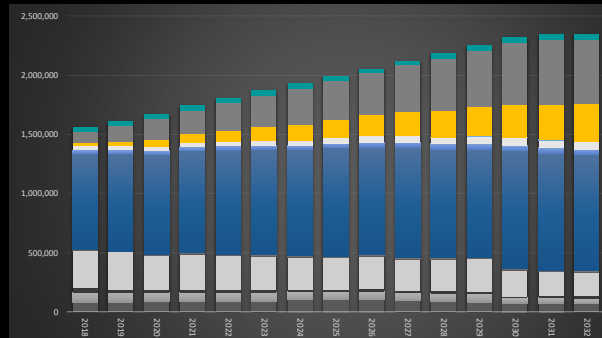
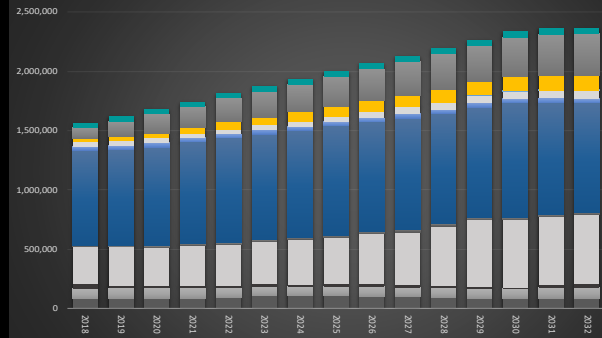
ECOSUD: Modeling the region

CONTINENTAL LATIN AMERICA

ENERGY PRODUCTION - GENERATION [GWh]



Description: Latin America Electricity Production Mix Forecast
 Horizon: 15 years [2018-2032]
 Units: Annual GWh (lossless)
 Scenarios: -BASE
 -RE: Renewable Energy
 -RE+INT: Interconnected and RE
 Notes: ECOSUD update. Central America + Mexico from GoF



What are the cost?: ECOSUD results

CONTINENTAL LATIN AMERICA

TOTAL COSTS: Production + Investment



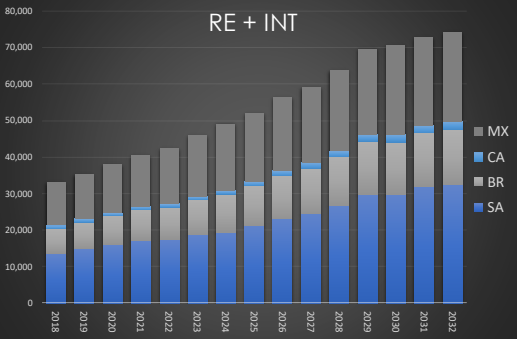
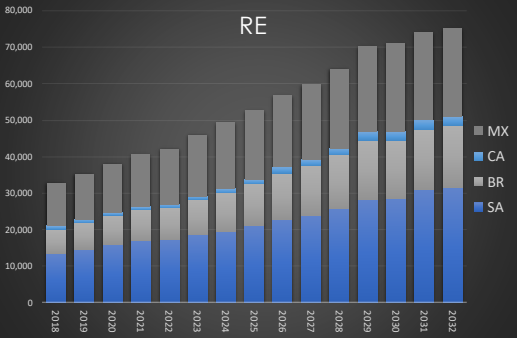
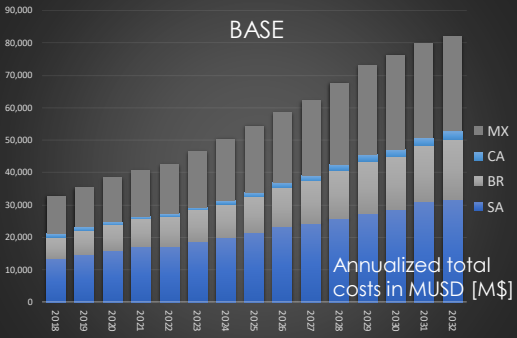
- MX
- CA
- BR
- SA

Description: LATIN AMERICA production and investment costs
Horizon: 15 years [2018-2032]
Units: Annualized Capital and Operational Costs in Million USD
Notes: Real annualized costs. Regional discount rate of 8% used for NPV calculations. WACC, economic life project specific. 2016 USD used for all input costs projections

BASE
B\$852
 Total Costs

RE
B\$817
 Total Costs

Re + INT
B\$812
 Total Costs



B\$466.1
 Generation Costs

B\$203.4
 Annualized Build Cost

B\$181.6
 FO&M Cost

B\$0.91
 Transmission Build Cost

B\$316.7
 Generation Costs

B\$303.4
 Annualized Build Cost

B\$194.6
 FO&M Cost

B\$ 2.3
 Transmission Build Cost

B\$310.7
 Generation Costs

B\$301.5
 Annualized Build Cost

B\$195.4
 FO&M Cost

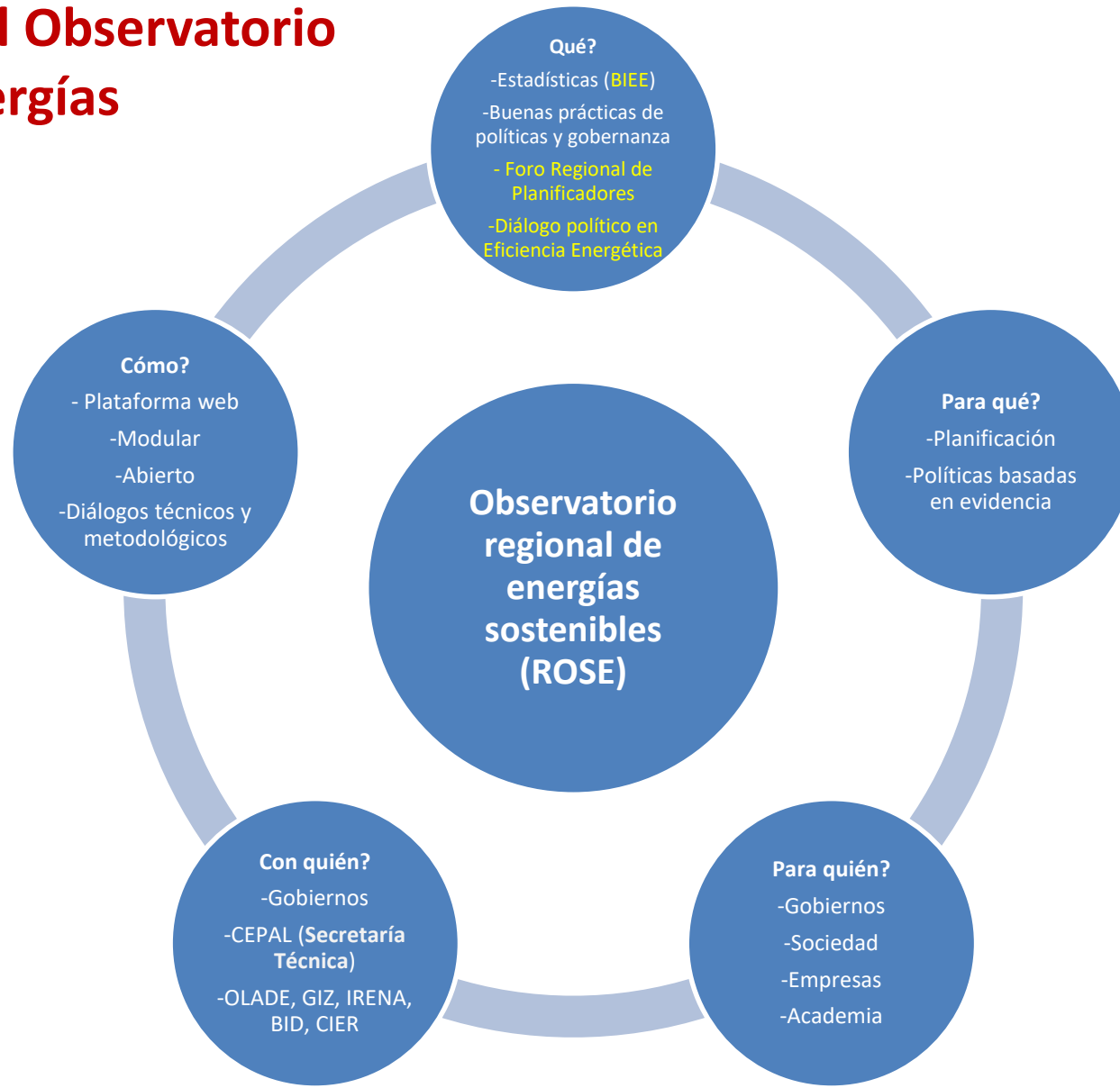
B\$4.61
 Transmission Build Cost

Para una mayor complementariedad, se requiere enfrentar la baja cobertura de redes de interconexión y regulaciones

Mapa de líneas actuales de transmisión de interconexiones transfronterizas

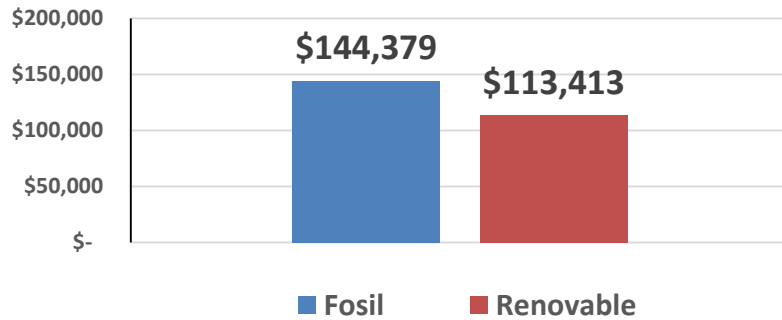


La gobernanza del Observatorio Regional sobre Energías Sostenibles (ROSE)

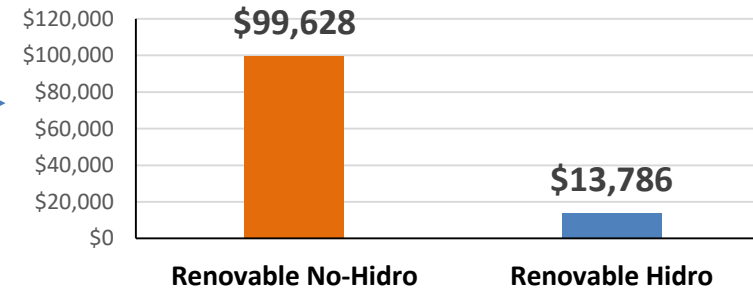


Announcement of Foreign/External Direct Investment in the energy sector: shows an increase in non-hydro renewables technologies, confirming the beginning of a transition.

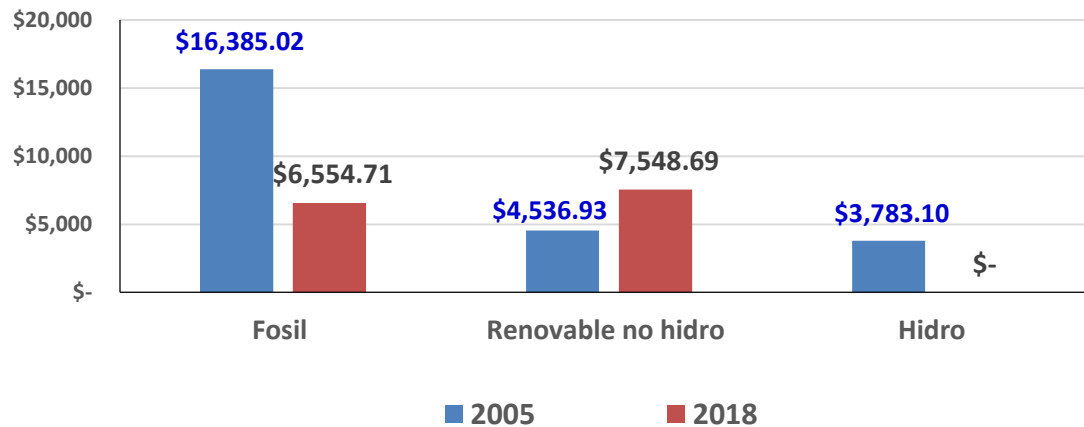
Accumulated investment 2005 and 2018 (MUSD)



Accumulated investment for non-hydro renewables and hydro 2005 and 2018 (MUSD)



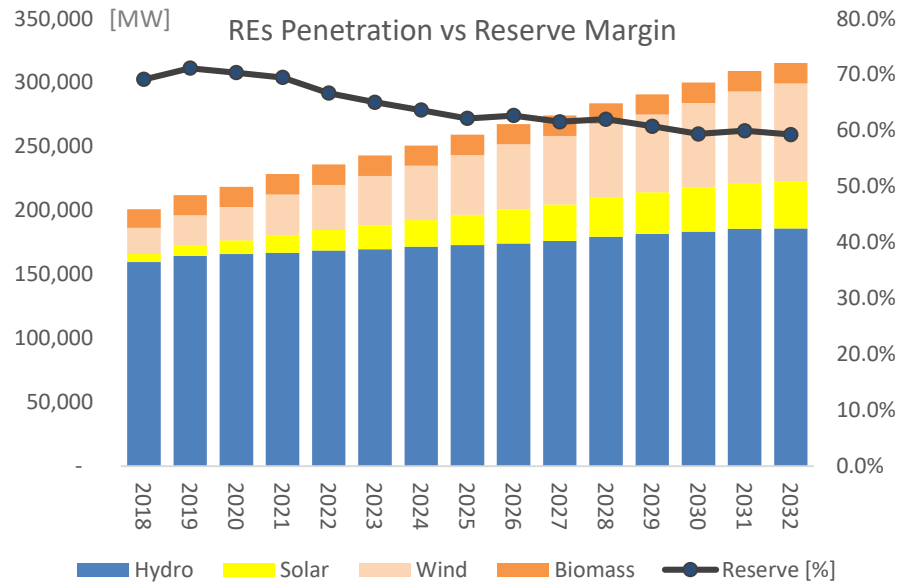
Comparison of Investment between 2005 and 2018 (MUSD) by technology



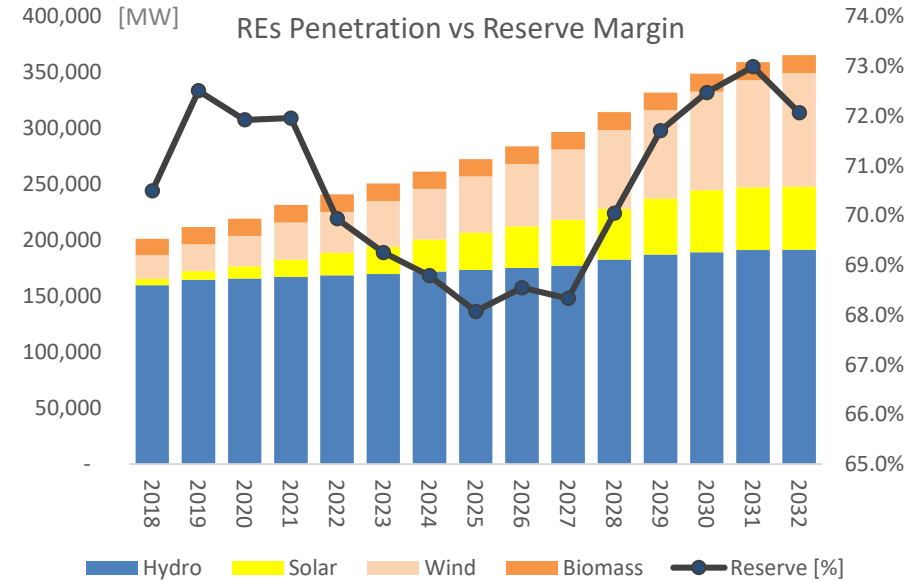
The foreign direct investment announced in the energy sector represents in renewables an annual investment of approximately 0.16% of the region's GDP (from 2005 to 2018) considering the annual regional GDP at constant dollar prices, while fossil fuels represent 0.21%.

ECOSUD RESULTS:

Flexibility, and Rotating mass to support system stability: Attention should be paid to the issue of margin reserve and ancillary/secondary services - storage will be key in the near future



Escenario base ECOSUD - Sudamérica

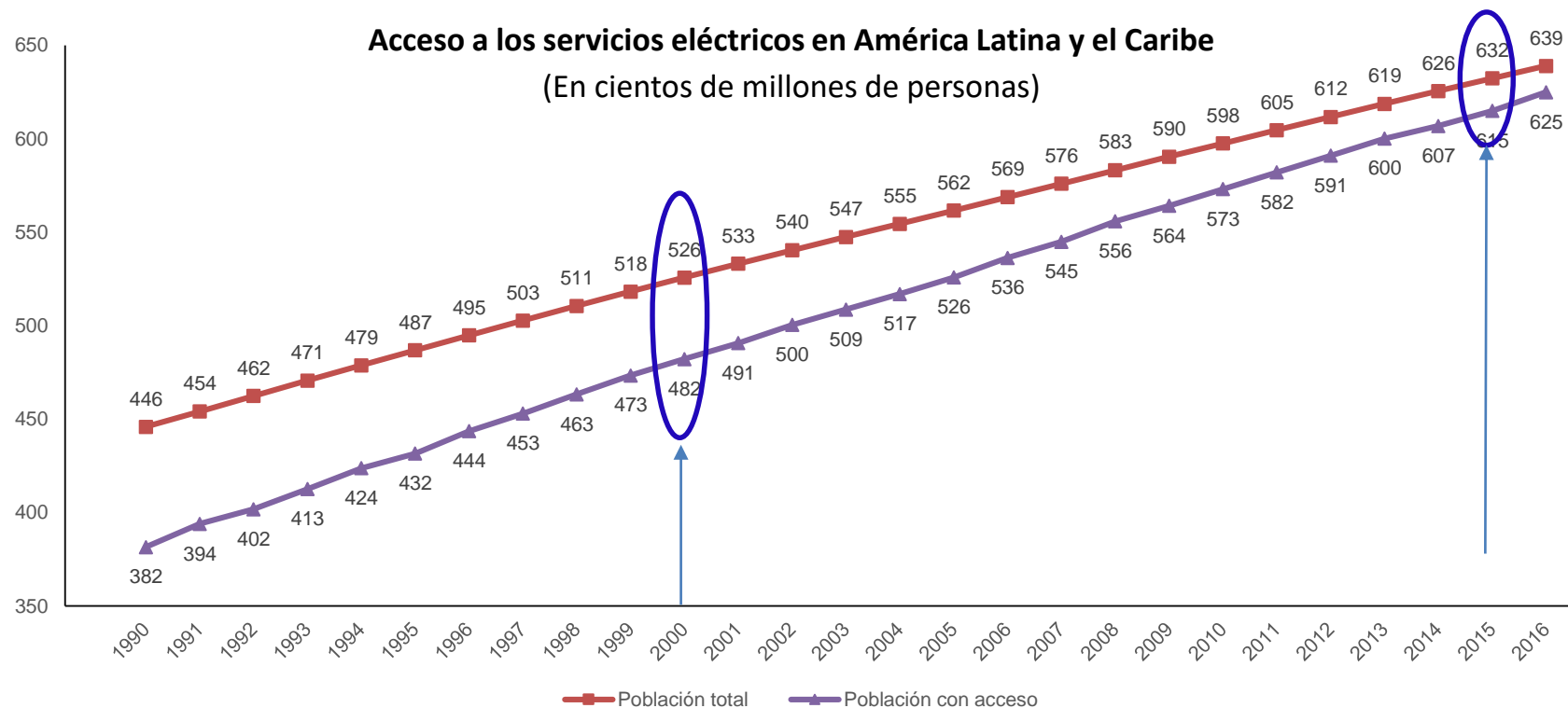


Escenario Renovables + Integración ECOSUD - Sudamérica

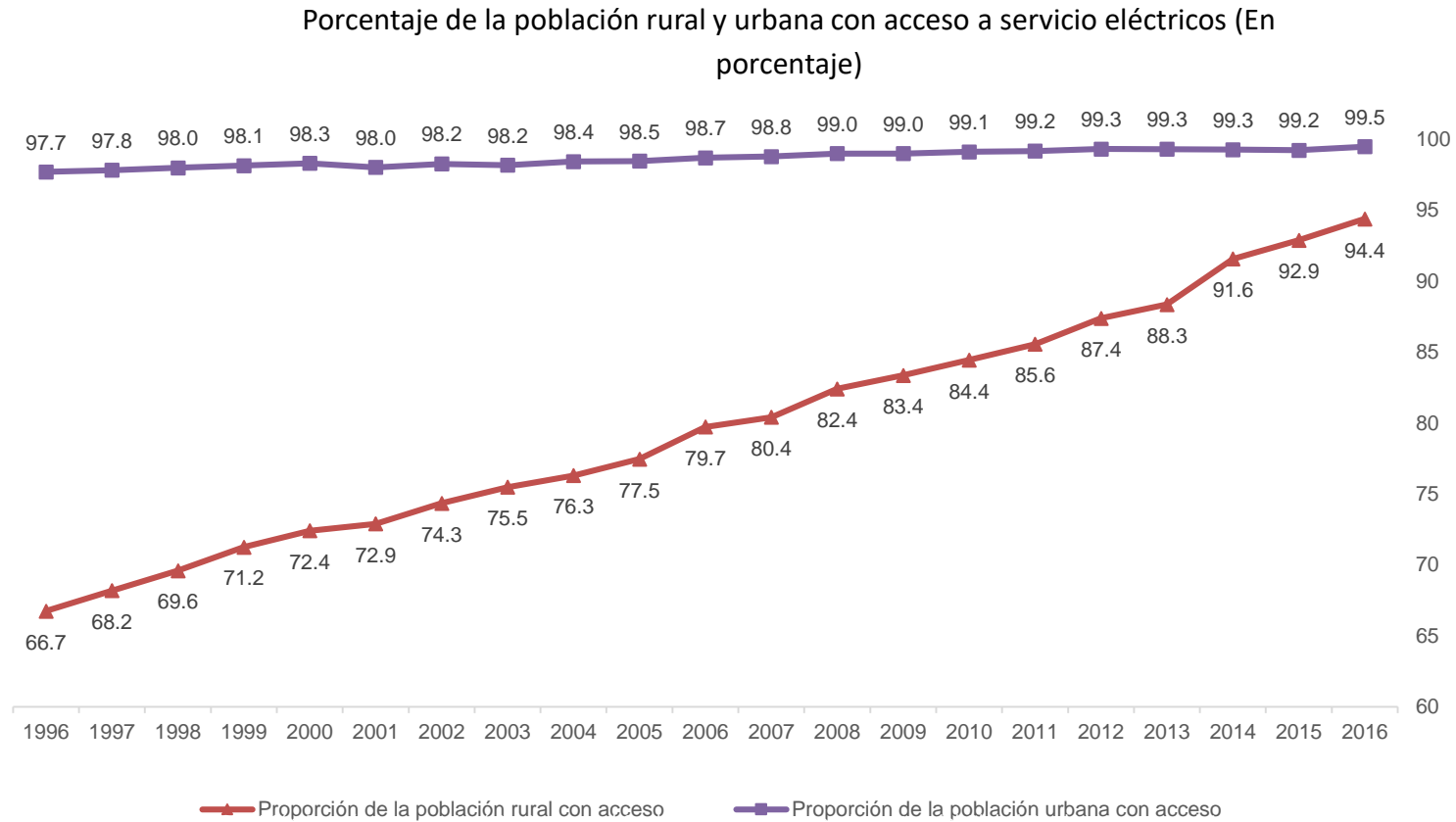
El escenario ER+INT (~800 mil millones US\$) representa a la región una inversión anual aproximada del 1% del PIB de la región (del año 2019 al 2032) considerando el PIB total anual a precios en dólares constantes.

Beyond Access

The number of people without access to electricity services fell from 43.6 million in 2000 to 14 million in 2016.



The rural-urban access gap has narrowed from 31% in 1990 to 5.1% in 2016.



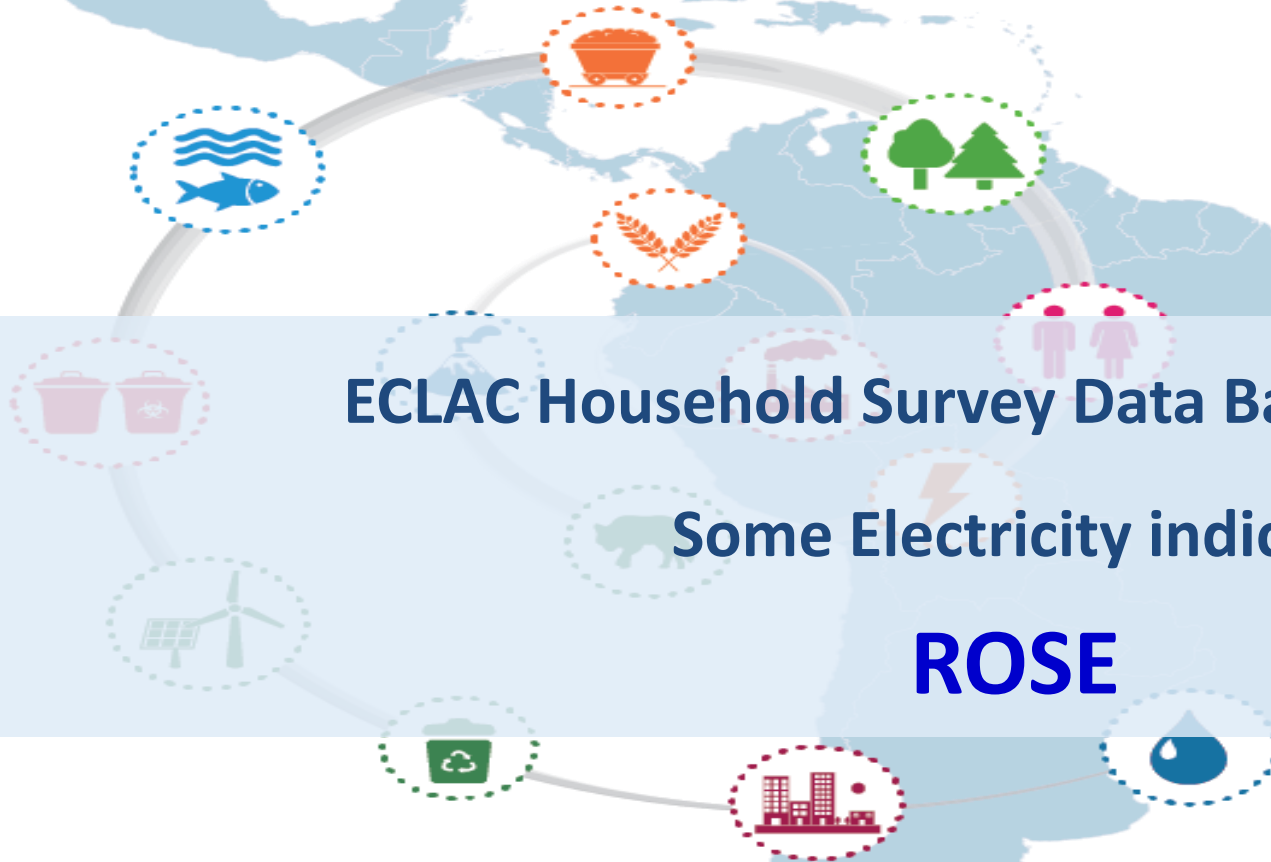


Actualizado a octubre de 2019

ECLAC Household Survey Data Bank processing

Some Electricity indicators

ROSE



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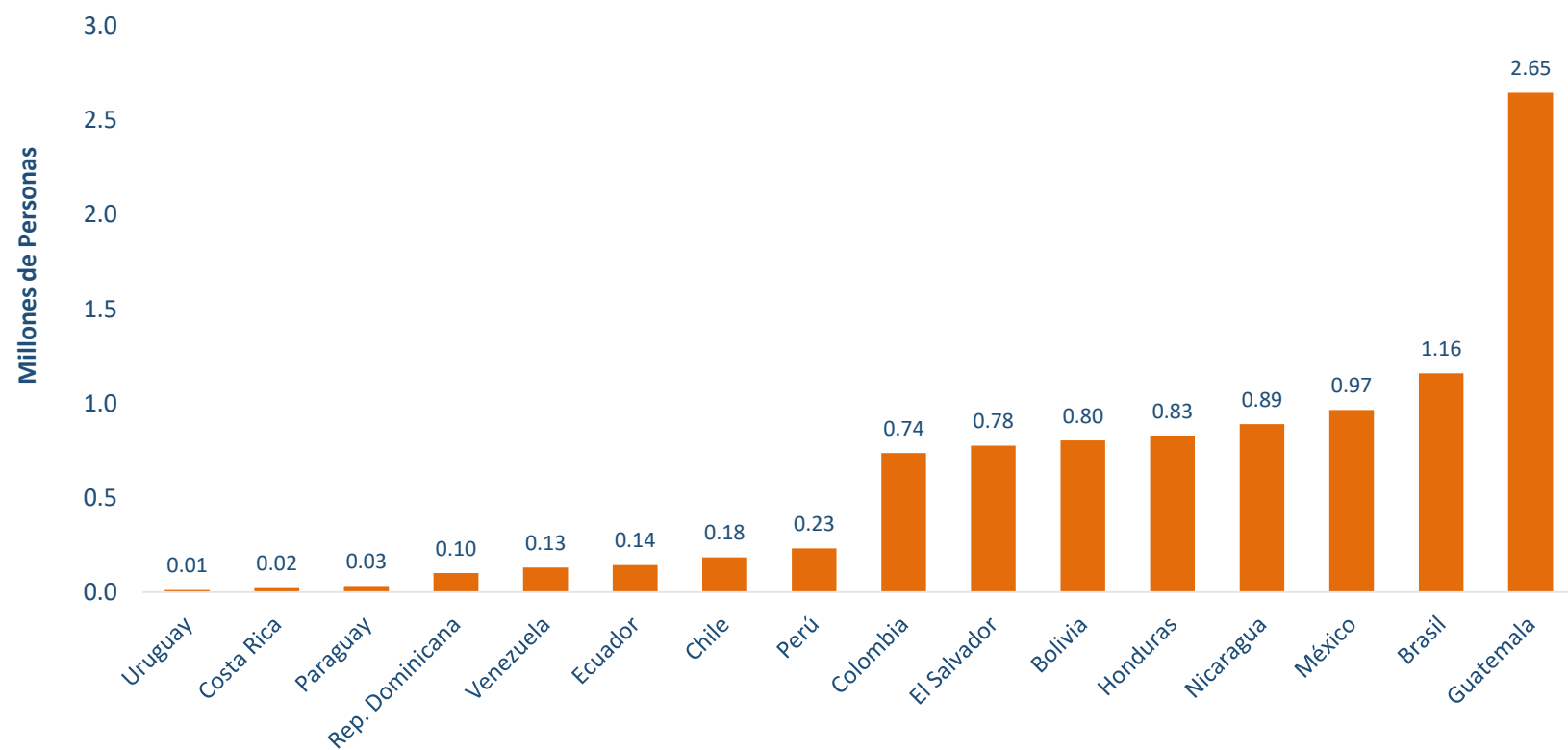
CEPAL



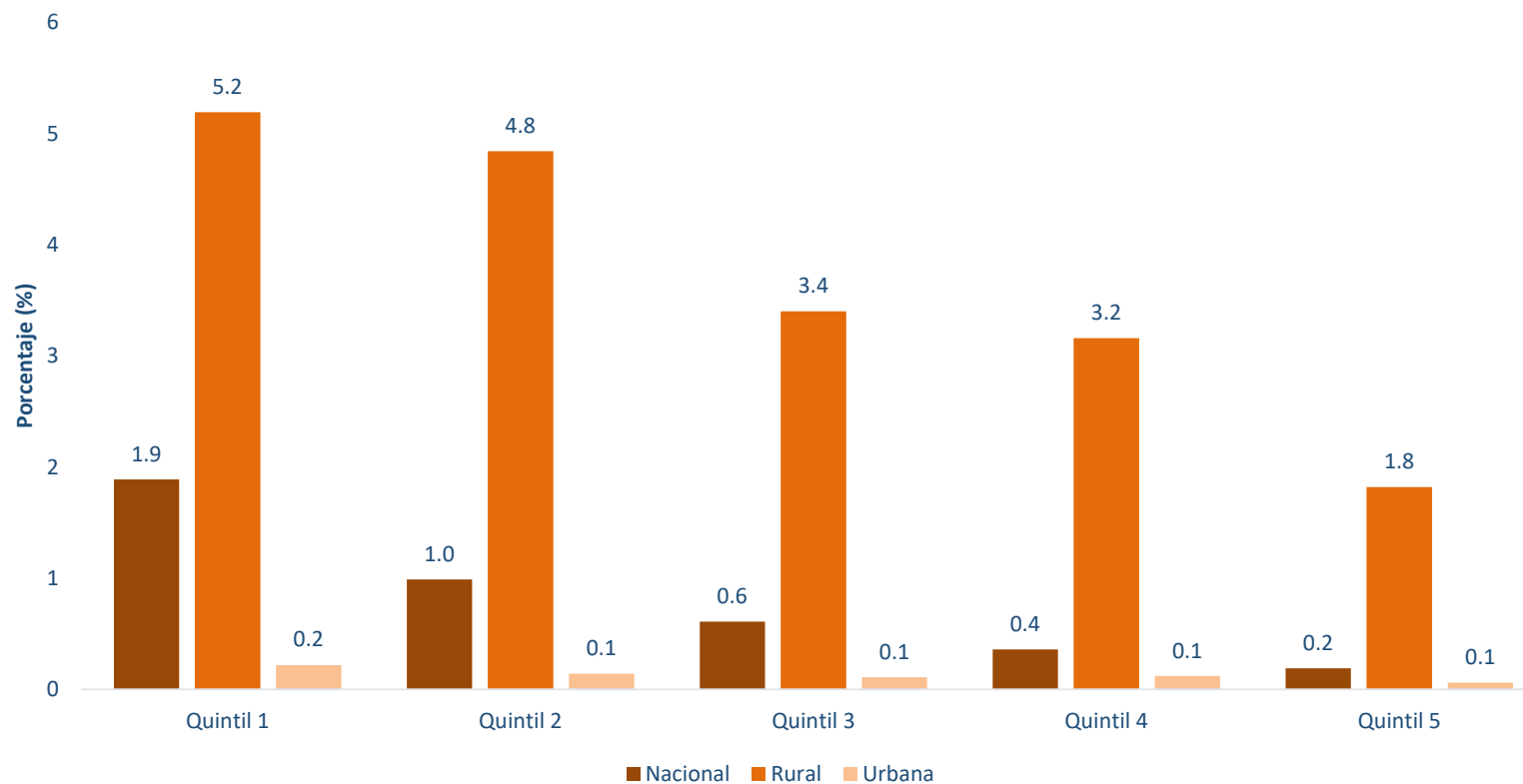
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Latin America: Number of people without access to electricity by country, latest available year (16 countries)

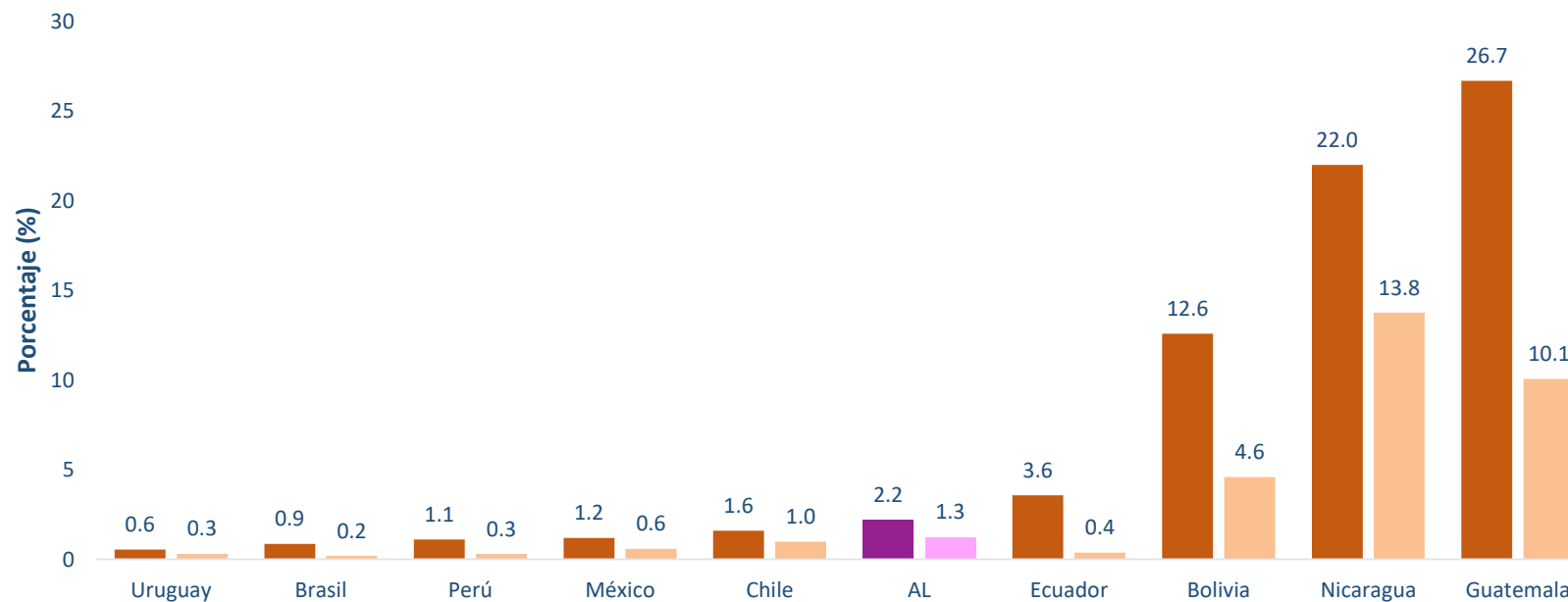


Latin America: Proportion of population without access to electricity by income quintiles (rural, urban and total), latest available year



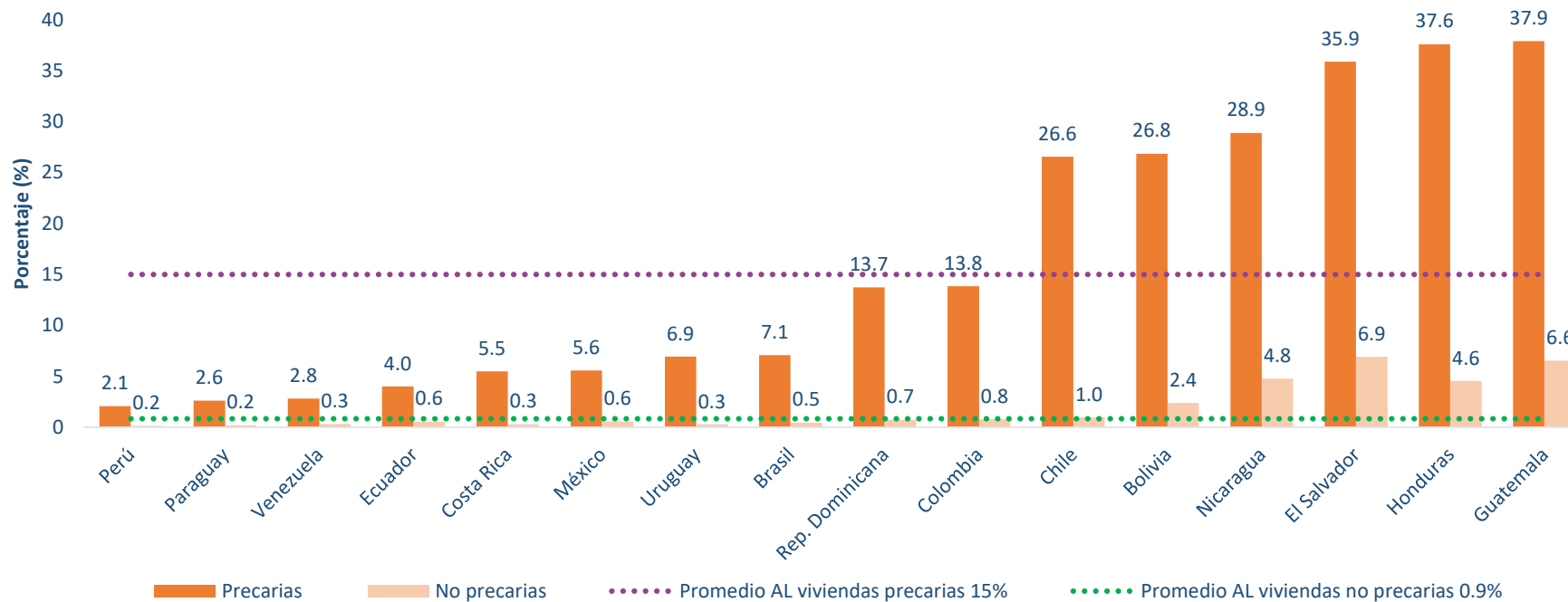
Fuente: CEPAL, Banco de Datos de Encuestas de Hogares (BADEOHG). Agregación regional por quintiles. Se incluyeron 16 países.

Latin America: Proportion of indigenous and Afro-descendant population and rest of population without access to electricity, latest available year



Fuente: CEPAL, Banco de Datos de Encuestas de Hogares (BADEOHG). Promedio regional ponderado por población. Se incluyeron 9 países.
ECLAC Household Survey Data Bank

Latin America: Proportion of population without access to electricity according to housing precariousness, latest available year



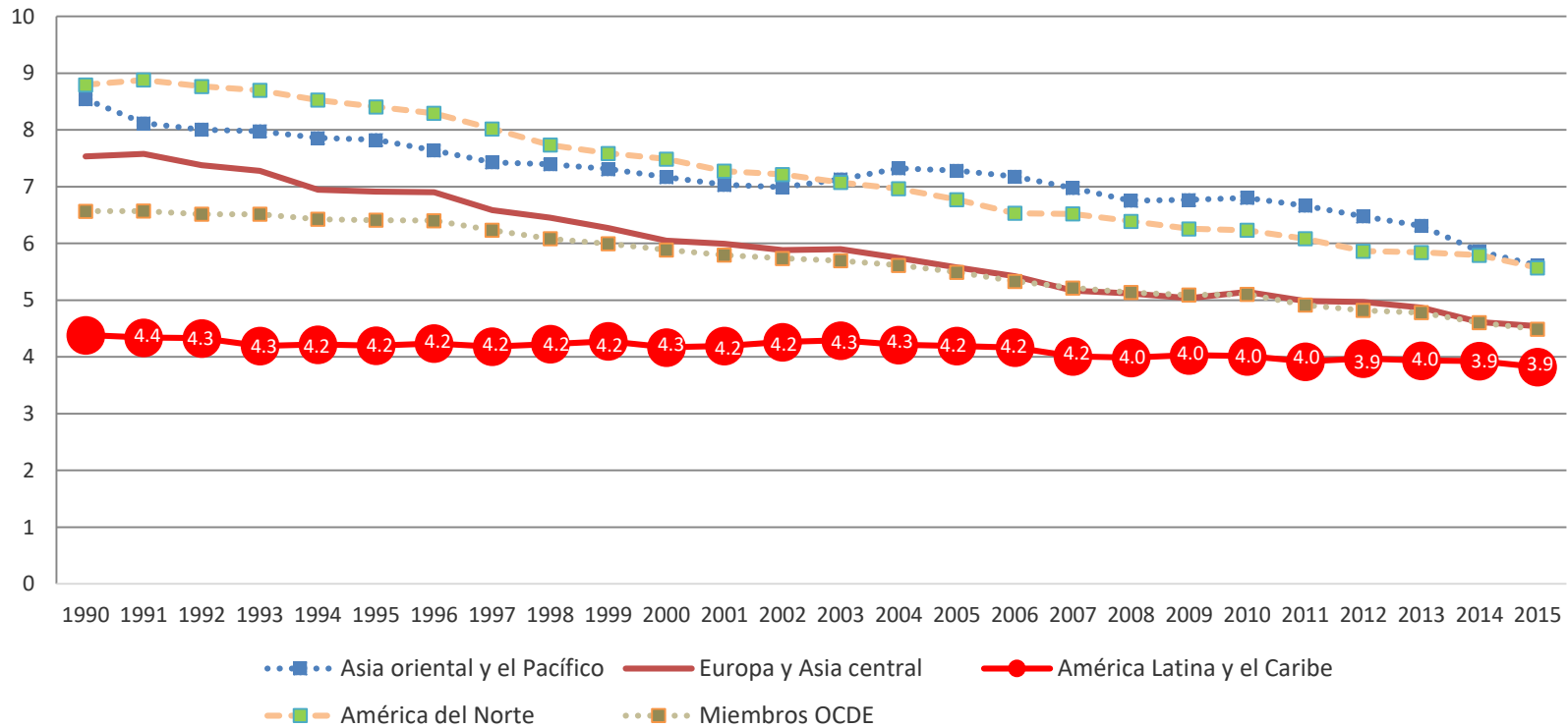
Fuente: CEPAL, Banco de Datos de Encuestas de Hogares (BADEOHG). Promedio ponderado por población. Se incluyeron 16 países.

Note: Precarious housing refers to deprivation in housing materials, which have been considered to be households in dwellings with irrecoverable materials in at least one aspect: ceiling, walls or floor. Example: Floor of earth or walls and/or ceiling of natural fibres and/or waste.

Energy Efficiency in LAC

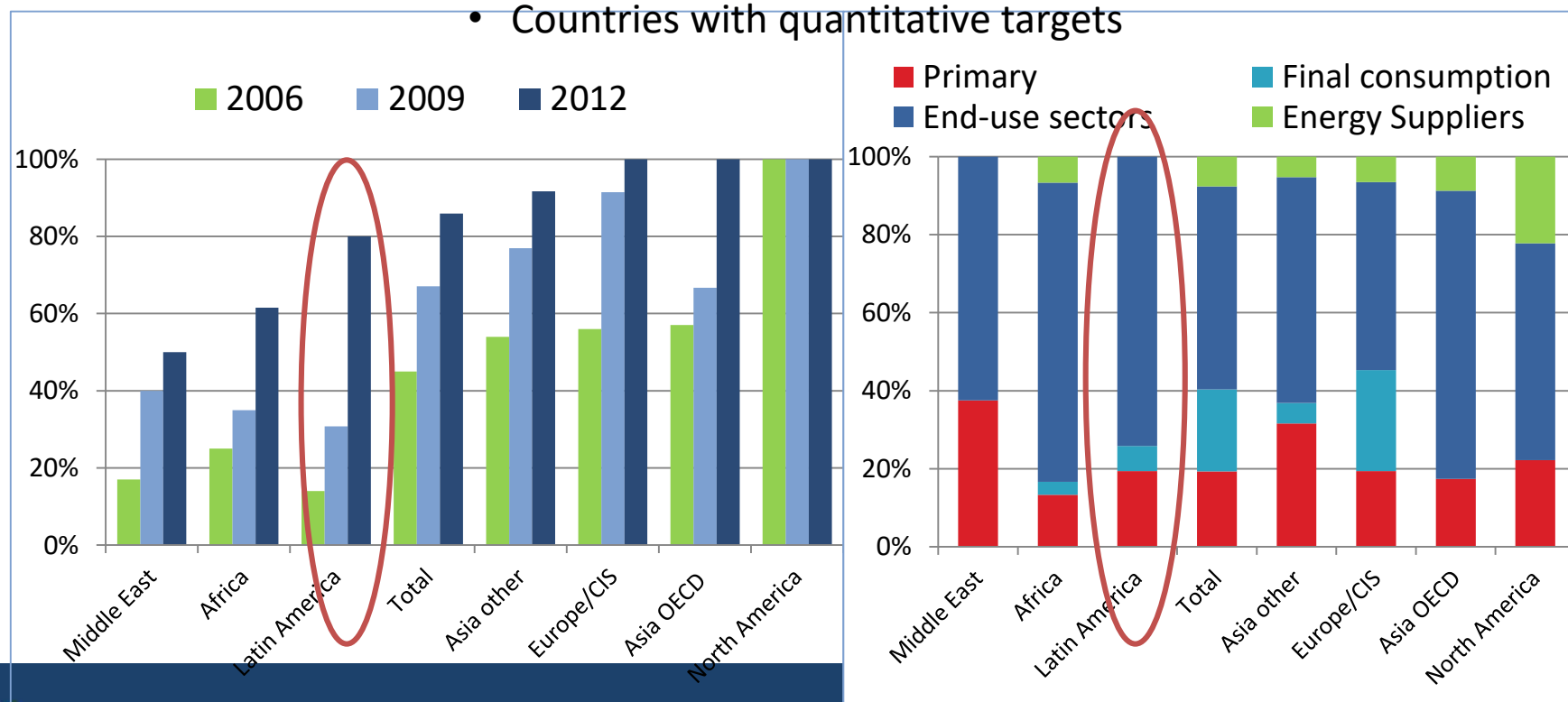
Is Energy Intensity useful for policy makers?

Energy intensity based on primary energy in Latin America and the Caribbean versus other regions (MegaJoule/GDP)



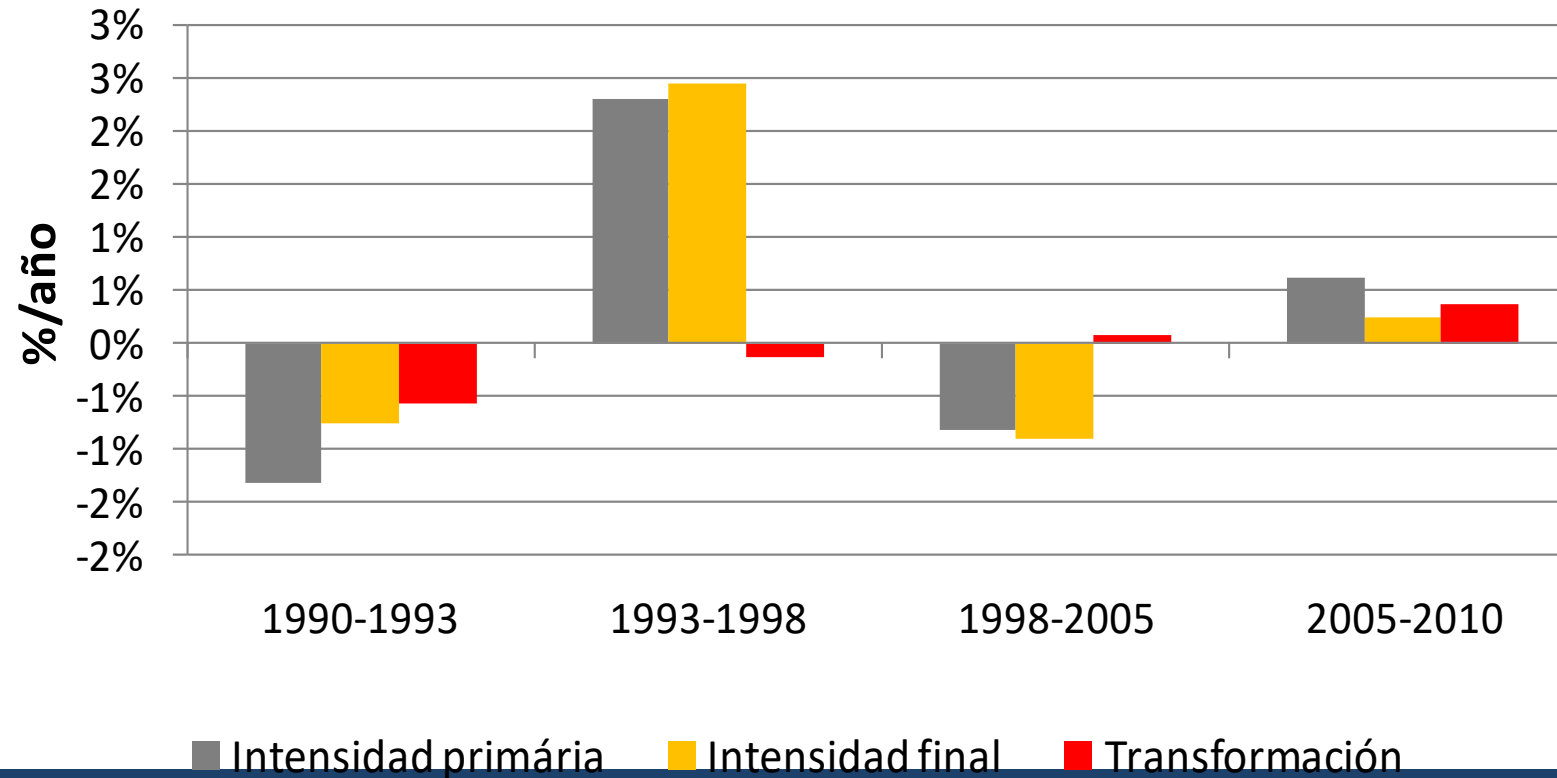
Increasing number of countries with quantitative targets

Targets are expressed in different ways and relate to different part of the consumption: on total (primary) consumption (around 20%) , on final energy consumption (around 20%) , or end-use sectors (case of 60% of countries)



Different trends as to the variation of **primary** and **final intensity** in Brazil depending on **energy transformations** and mainly the power sector
 Since 1998, and especially since 2005, energy transformations contribute to increase the primary intensity due to the development of thermal power generation and biofuels production

Primary and final intensity trends: case of Brazil



THANKS

ECLAC Partners for Sustainable Energy



UNITED NATIONS
ECONOMIC COMMISSIONS



IRENA
International Renewable Energy Agency

ADEME



Agence de l'Environnement
et de la Maîtrise de l'Énergie



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