Latin America and the Caribbean Energy & Water Management Transitions

Side event: Advancing Climate Change Mitigation and Adaptation through Integrated Innovative Sustainable Water and Energy Solutions- COP 28

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December 4th, 2023
The region has the most renewable electricity generation matrix of the world, 73% generated from hydropower, while water related disasters have doubled in past years.

<table>
<thead>
<tr>
<th>Decade</th>
<th>Droughts</th>
<th>Floods</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-1990</td>
<td>48</td>
<td>275</td>
<td>323</td>
</tr>
<tr>
<td>2000-2020</td>
<td>89</td>
<td>559</td>
<td>648</td>
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</tbody>
</table>

Over 70% of existing hydropower plants, lithium and copper mines and 65% of fossil fuel power plants need to be prepared to cope with drier climates.

And conflicts: the region holds over 364 environmental conflicts associated to multipurpose water dams.

Source: SieLAC-OLADE (2021)

Source: Latin America Energy Outlook (2023) IEA
Electric interconnections and transboundary water cooperation are key for climate change adaptation

• In the Southern cone, interconnections are mainly based on hydroelectric power plants.

• Some bilateral electric agreements have been successful:
  • Itaipú, between Paraguay and Brazil,
  • Argentina, Brazil, and Chile, for emergency exchanges during droughts.

• 76% (19 GW) of the installed capacity for electricity exchange comes from binational hydroelectric plants.

• Electricity exchanges account for less than 3% of total electricity generation in Latin America (15% would be an optimal rate for integration).

• 71% of surface water belongs to transboundary systems, while only 24% of them have a water operational arrangement in place.

Proportion of transboundary basins with operational agreement for water cooperation (%)

Source: UNSTAT (2022)
Methane recovery for electricity generation from wastewater treatment can serve as mitigation strategy

Methane emissions from wastewater account for 10% of total methane emissions
• The second largest greenhouse gas, methane emissions in LAC **have grown by almost 40%** since 1990.
• Emissions are projected to **increase by 19%** between 2010 and 2030.
• According to IPCC, they **need to be reduced by a third**.

While wastewater treatment plants on mega-cities already adopt **circular economy principles**, focus is now on **mid-sized cities and municipalities**.

Study was done considering **75 mid-size WWTPs** from 5 countries: Mexico, Colombia, Costa Rica, Peru and Bolivia.
• An **investment of USD 251 million** is required to adopt circular economy principles.
• Annual revenues from **electricity cost savings** of USD 46.6 million would be generated.

**Benefits derived from methane use IN 75 WWTPs:**

**Environmental benefits**
1.3 million tonnes/year of CO2 reduction, **18% of Nicaragua’s annual emissions**.

**Economic benefits**
In 10 years, a present net income of **USD $260.4 million** would be obtained.

**Socioeconomic benefits**
In 20 years, the investment has a **benefit/ cost ratio of 1.36.**
Towards a water & energy transition in Latin American and Caribbean countries

**Water**

**Investments:** 1.3% of the annual GDP of the region in 10 years, can close the gap can create 36 million Jobs.

**Equity and affordability:** Quintile 1 has **25% less** access to safely managed water, while paying double for it.

Reverse **negative externalities:** +30% pollution, +200% conflicts over water, in past 4 decades.

Promote the **circular economy** through the water value chain

**Energy**

**Universalize access** to electricity: Quintile 1 has 9 times less access and pays 5 times more.

Investments: 1.3% of the annual GDP in 10 years increases **renewable electricity** generation up to 80%, **reducing CO2 emissions** by 32% and 7 million jobs.

Improve **energy efficiency** in all economic sectors: Energy intensity in GDP of the region has decreased by 18% over the last three decades.

Strengthen **energy integration**.

Enhance energy security and regional resilience to **external impacts**.
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