ecpa | Energy and Climate Partnership of the Americas

Promoting cooperation for a sustainable energy future in the Americas

ecpamericas.org

Understanding the Water - Energy Nexus

Interdependence + Mutual Reliance

Water for Energy

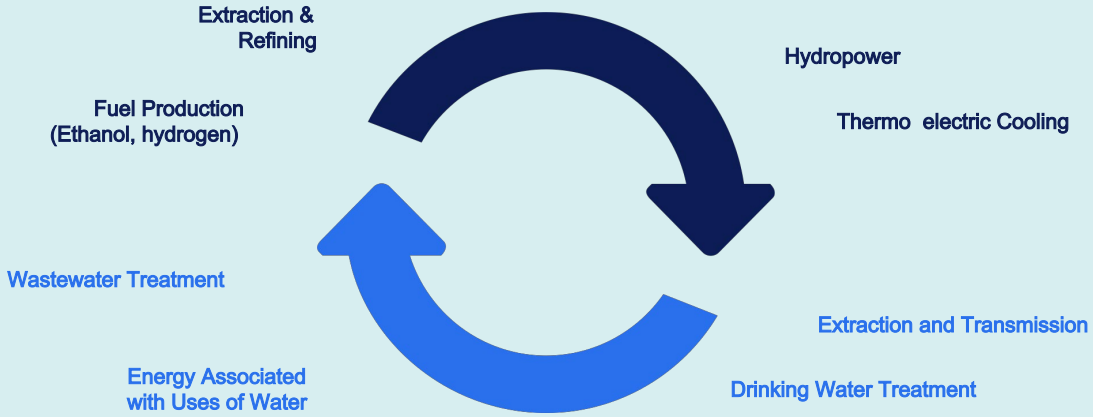
1. Production
2. Distribution
3. Consumption

Energy for Water

1. Extraction
2. Treatment
3. Distribution

ecpa

Water for Energy



Energy for Water

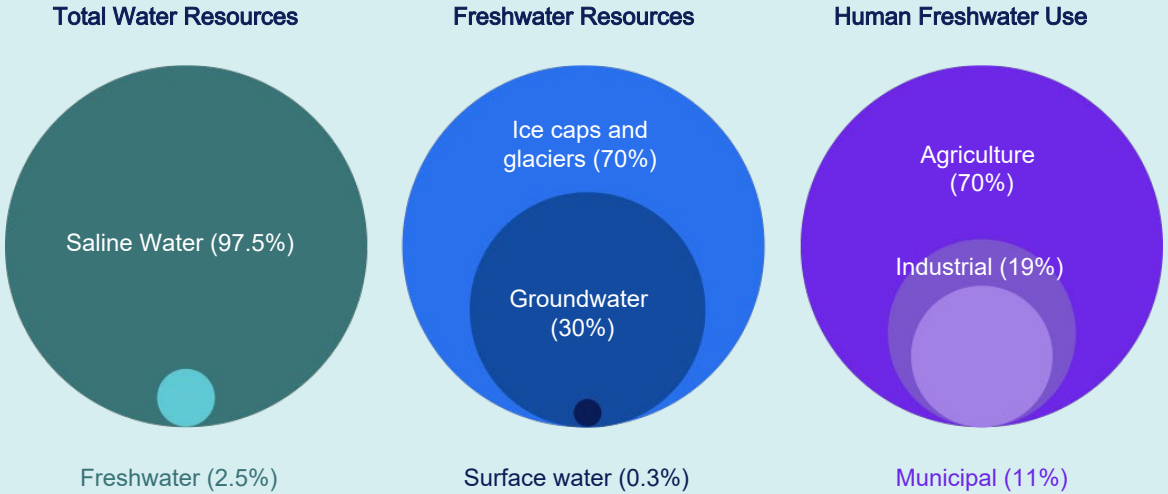
Water for Energy

Primary Energy	Uses
Oil & Gas	Drilling, well completion and hydraulic fracturing. Injection into the reservoir in secondary and enhanced oil recovery. Oil sands mining and in-situ recovery. Upgrading and refining into products.
Coal	Cutting and dust suppression in mining and hauling. Washing to improve coal quality. Re-vegetation of surface mines. Long-distance transport via coal slurry.
Biofuels	Irrigation for feedstock crop growth. Wet milling, washing and cooling in the fuel conversion process.

Water for Energy

Electricity	Uses
Thermal (fossil fuel, nuclear and bioenergy)	Boiler feed, i.e. the water used to generate steam or hot water. Cooling for steam - condensing. Pollutant scrubbing using emissions control equipment.
Concentrating solar power and geothermal	System fluids or boiler feed, i.e. the water used to generate steam or hot water. Cooling for steam - condensing.
Hydropower	Storage in a reservoir (for operating hydro - electric dams or energy storage).

Scarcity



Source: Shiklomanov (1993); UN FAO Aquastat dataset.

Rising Demand

- Population growth
- Improved standards of living
- Scarcer freshwater supplies near population
- Climate change
- 15% of global water withdrawals are linked to energy (Agriculture: 70%) (IEA, 2010)

ecpa

Energy transition alleviates pressure on water resources

People with no access to

Electricity		750 million (IEA, 2022)	9.5% of the world population
Water		2 billion (UN, 2023)	25% of the world population

Water for energy (extraction/processing)

Petroleum -based fuels		7-15 liters per liter of fuel
Natural gas		20-50 liters per BOE

ecpa

Energy transition alleviates pressure on water resources

PROs

- Reduced water withdrawal
- Lower water pollution
- Decreased competition for water
- Climate change mitigation
- Energy for water treatment

CONs

- Hydropower
- Bioenergy

OVERALL IMPACT on H2O:
Dependent on careful planning and management

ecpa

ecpamericas.org

Financing

- High Initial Investment Costs
- Complex Funding Structures
- Return on Investment Uncertainty
- Lack of Dedicated Funding Sources
- Policy and Regulatory Barriers

ecpa

ecpamericas.org

Cross - Sectoral Cooperation

- Pooling Resources for Greater Impact
- Shared Benefits and Risk Mitigation
- Innovative Financing Models
- Policy Alignment and Advocacy
- Leveraging International Funding and Support

ecpa

Moving Forward

- Cross-sectoral partnerships
- Nexus-guided R&D and decision -making
- Integrated water and energy data and models
- Maximize new infrastructure and existing resources through synergies
- Prioritize RE investments based on projected water availability and migration patterns
- New financing instruments
- Policy integration and harmonization
- Education and awareness

Thank you.

ecpamericas.org

ecpa | Energy and Climate Partnership of the Americas