

# Comprehensive water management

- Efficient use of water
- Synergy
- Governance
- Knowledge and information
- 2018 Challenges

Committed  
to the SDGs





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*We have the idea that natural resources are unlimited, and there seems to be great competition for water, not only in terms of quantity but of quality, which becomes a major challenge for our survival as human beings, and for the viability of the energy generation business, whose backbone happens to be hydroelectric power. For that reason, we work with our stakeholders to ensure that water is properly managed and protected, as it is key in preserving life and contributing to territorial wellbeing and the country's progress.*

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**Omar Darío Rengifo Celis**  
Undergraduate  
Environmental Production  
ISAGEN



# 2017 Milestones



- A total of 549 people attended the Water Conference held in association with El Espectador, WWF and People & Earth as a space to promote environmental proposals to strengthen the National Water Policy.
- We verified compliance of the 13 agreements executed in 2016 with territorial actors to care for the Nare River basin in the framework of the Water Stewardship initiative, with satisfactory results.
- We built alliances with Corpocaldas and Cortolima regional autonomous corporations for the environmental recovery of the basins and develop initiatives in line with Classification and Watershed Management Plans (POMCAS, for the Spanish original).



*There is a global consensus on the narrow link between water, energy and food; therefore, it is necessary to have a comprehensive treatment of water resources to improve the efficiency of their use, mitigate and control shortage risks, create synergy between users and projects, and to have governance that is coordinated across all sectors. In fact, 13 of the 17 UN Sustainable Development Goals (SDGs) are related to coordinating these elements. Another important aspect is the dependence of the economic activities of a finite and vulnerable resource, threatened because of the pressure on its use, contamination, shortage, variability and climate change.*

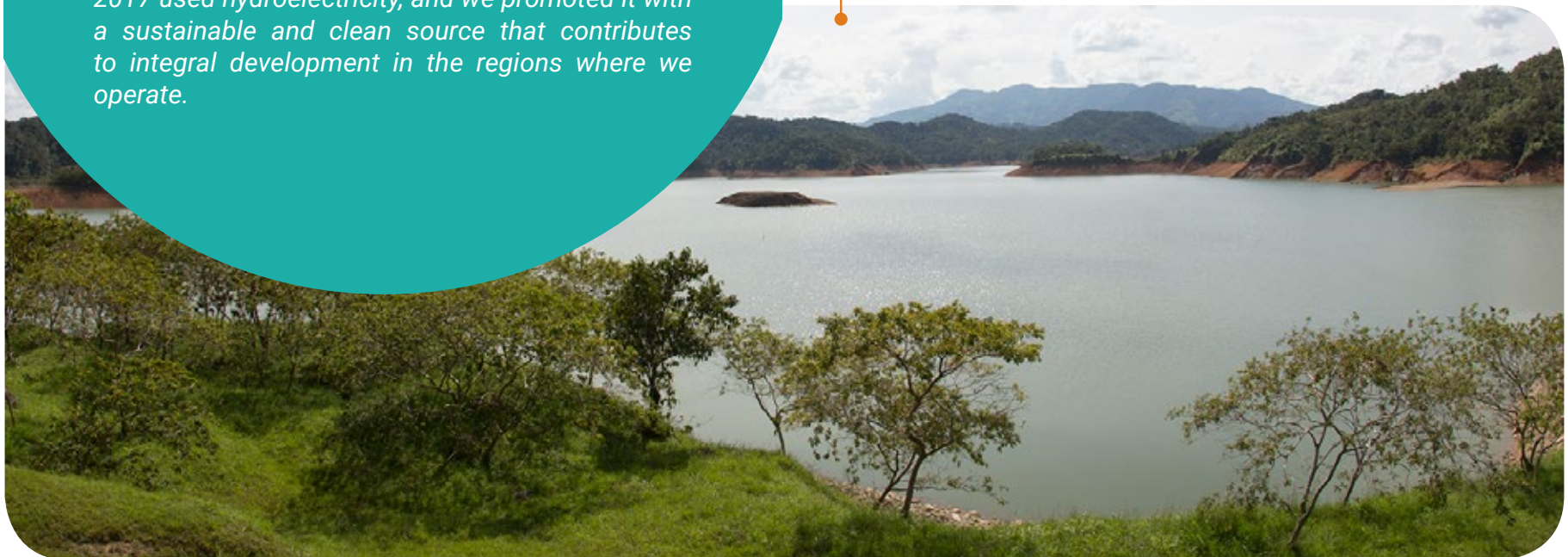
*The solution to this problem requires strengthening management of water at the national level in order to improve its administration, conservation and care. Moreover, 99.4% of the energy produced in 2017 used hydroelectricity, and we promoted it with a sustainable and clean source that contributes to integral development in the regions where we operate.*

Water is a strategic resource for our business, and we manage it in a comprehensive manner, taking the following aspects into account: research on the effects of climate change and climate variability on the water resource; formulate and implement flow estimate models under scenarios of climate change and variability; develop energy generation projects using renewable sources, including those that are compatible with hydrological conditions at the plants; protect and care for the basins associated to our plants; and promote national policies that stipulate proper management of the water resource.

In 2017, we worked on formulating a strategic guideline to manage climate change and water that aims to take optimal, responsible advantage of the water resource as we develop all our activities while adapting to the effect of climate change.

We present the main results for 2017 and 2018 challenges.

Jaguas Hydroelectric Power Plant San Lorenzo Reservoir (170 MW) in Antioquia.



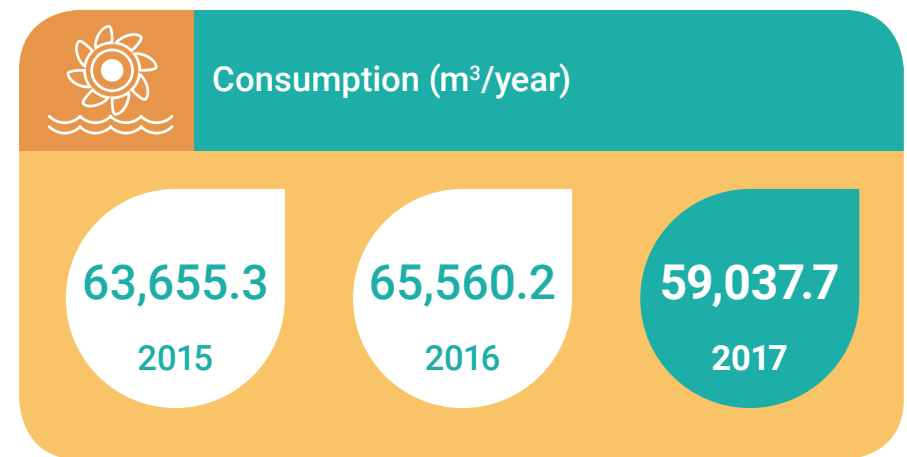
# Efficient use of water

We only use water from allocated sources for our operations and domestic use, pursuant to regulations. The resource is supplied to employees, contractors and visitors at our power plants through distribution networks when used for human consumption. Since 2015, water allocated for domestic use at our power plants is 355.4 l/s. Following is a description of consumption for the past three years:



Calderas Hydroelectric Power Plant reservoir (26 MW) in Antioquia.

## Total domestic water consumption\* in the power plants (2015-2017)



Water consumption in 2017 was 9.95% lower than 2016 thanks to efforts to monitor and control its use, maintain the networks and treatment systems, monitor water quality, and programs aimed at using water efficiently, to name a few.

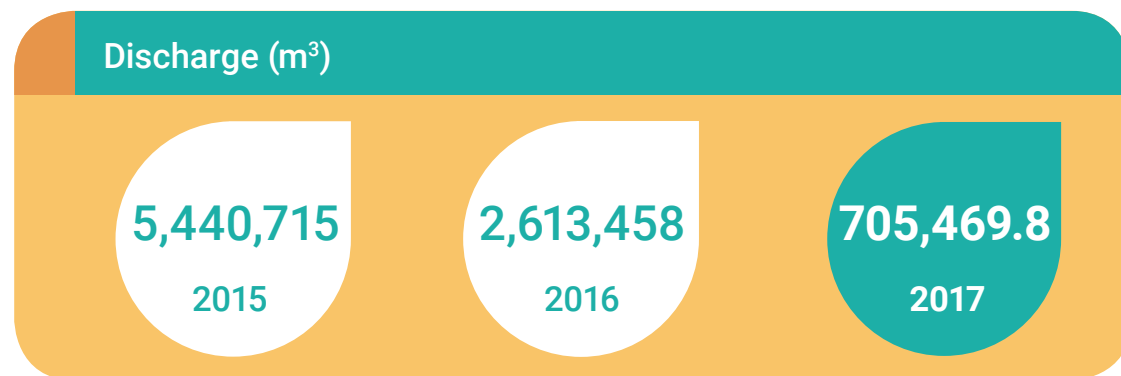
\* Water consumption at Medellín's administrative headquarters was not reported because data from the power plants provides information about the business' impact on the water resource.

## Total per capita water consumption in the power plants (2015-2017)

2016 saw an increase of 2.86% in domestic per capita water consumption, which is the amount of water a person has for his or her daily needs. Six of the seven power plants reported lower water consumption than the goal set thanks to the well-executed savings plans and the efficient use of water. In the case of the Termocentro Thermal Power Plant, the increase that exceeded the defined goal resulted from pipe damage that increased water consumption, which was corrected on time.

Power plant	Consumption per capita (l/person/day)			
	2015	2016	2017	Goal
Amoyá	142.1	132.3	128.5	190
Calderas	127.2	118.6	135.1	176
Jaguas	186.4	161.1	166.6	186
Miel I	166.7	161.3	192.9	245
San Carlos	163.9	156.6	159.4	196
Sogamoso	266	317.5	200.5	210
Termocentro	263.9	264.1	366.1	250

## Total volume of wastewater discharge in the power plants (2015-2017)



We have wastewater treatment systems (domestic and industrial) at the power plants that allow for the purification of discharge at sufficient levels to be delivered to the soil and surface water sources. Termocentro's stabilization pond is the treatment system for industrial wastewater, and it corresponds to 51% of the discharge volume there. When parameters outside the established limits are identified, we perform maintenance on the system and report it to the environmental authority. Furthermore, the discharges were

applied on bodies of water that are not classified as RAMSAR wetlands, which have international relevance due to their ecological, economic, cultural, scientific and recreational value.

In 2017, the volume of wastewater discharge (domestic and industrial) reported a 73% reduction over 2016 resulting from a drop in industrial water consumption at the Termocentro Thermal Power Plant (83% compared to the previous year). Water quality monitoring showed that discharges did not affect water quality nor generate significant impacts on them. Additionally, we applied the new discharge regulation to the systems that spill into surface water sources, which measures the concentration (milligrams per liter), taking various parameters into account. Any systems displaying some deviation from a parameter were given maintenance, and we established corrective measures needed for improvement.

# Synergies

## Water Custody

Since 2014, we have been participating in this international initiative in partnership with WWF Colombia, contributing to knowledge of the water footprint and strengthening dialog between the actors of the Nare River basin so they can formulate voluntary agreements focused on protecting water, moving from a philosophical commitment to concrete actions. In 2017, we continued the dialogs for Water Custody, which were welcomed in the region, and in the framework of this activity we created a Monitoring Committee that supervised the 13 agreements executed in 2016 with the 67 communities, institutions and other stakeholders, to care for the river basin. Conclusion: We made satisfactory progress in executing the agreements; one opportunity for improvement would be to encourage active participation by some members of the group that signed the agreements. For this reason, it is necessary to continue generating spaces for dialog and coordination.

In the framework of this initiative, we reviewed and validated a water governance tool from the Organization for Economic Co-operation and Development (OECD) in order to discover how this methodology and indicators can help monitor water governance in Eastern Antioquia. Actors in the territory gave their recommendations, based on their own experiences, to improve this tool, which will be launched in the next World Water Forum in 2018.

## Comprehensive Action Plans (CAP)

Comprehensive Action Plans (CAP) originate as platforms for dialog and coordination to transform socio-environmental conflict at the Guarinó and La Miel River basins. The actors analyze problems and endeavor to formulate, manage and execute actions to protect, recover and develop the river basins. We can highlight our collaborative efforts in 2017 with the Corpocaldas and Cortolima regional autonomous corporations, focused on the environmental recovery of the basins through actions that align with the Classification and Watershed Management Plans (POMCAS, for the Spanish original). We also implemented sustainability agreements at the Miel River basin aimed at social and environmental recovery, in addition to inter-institutional roundtables in North Tolima and Eastern Caldas, among other mechanisms, to contribute to regional environmental improvement. Finally, we point to the construction and refurbishment of 46 sanitation units and bioengineering and productive reconversion activities at three sites that had high sediment inflow to the Guarinó River.



# Governance

## Water Conferences

Since 2012, we have been holding Water Conferences in cooperation with the El Espectador newspaper, WWF and People & Earth. This initiative gathers organizations from government, academia, business and civil society to find solutions and generate voluntary public and private agreements on water governance. In 2017, dialogs focused on finding alternatives to strengthen the National Water Policy, and to learn about the environmental proposals to strengthen Colombia's water resource by presidential candidates, thereby contributing to its sustainable development. A total of 549 people participated in these spaces.

### Learn more about:



[2017 Water Conference magazine](#)

[Proposals for Water Conferences for Water Resource Governance in Colombia](#)

## Promotion of public policies

We continued to participate in different national and regional scenarios promoting water, including the Environmental Committee of the Colombian Association of Power Generation Companies (ACOLGEN, for the Spanish original) and the Chamber of Environmental Matters of the Colombian Association of Utility and Communications Companies (ANDESCO, for the Spanish original). In the framework of the Water Conferences, we disseminated a proposal to strengthen the National Water Council, whose purpose is to help adequately manage the demand for water, and anticipate potential conflicts in its use by improving its management, conservation and care.

# Knowledge and information

We conducted monthly campaigns to measure water flows and sediment at the main river effluents of our reservoirs to collect and analyze information that will help us estimate and characterize the sediment transported by the rivers, as well as define rates and patterns associated to how it is deposited in the reservoirs, to contribute to their sustainability. We also endeavored to coordinate with the Valle de Aburrá Metropolitan Area and the Empresas Públicas de Medellín (EPM) to operate and maintain the Medellín and Aburrá Valley Early Warning System (EWS). The inter-institutional agreement will continue through February 2019 and provide real-time information on climate variations that will help us to monitor and improve weather forecasts for the basins at the San Carlos, Jaguas, Calderas, Miel I hydroelectric power plants and their two diversions.

### Learn more about:



[Relevant topics, their description, impact and correlation with other management issues](#)







# 2018 Challenges



- Begin implementation of the strategic guidelines to manage climate change and water (2018-2030).
- Hold the 2018 Water Conference to promote water governance and protection of river basins in territories where we operate.
- Continue alliance between ISAGEN and WWF to monitor and disseminate collective agreements about water resource management in Eastern Antioquia executed in 2016; identify economic instruments to manage this resource in this region and coordinate with the sector for sustainable energy development; and continue to analyze climate variability and its impact on the hydroelectric power plants.



# Energy that **inspires** **civil society** **organizations**

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*The talks on water custody are a very important initiative for the Eastern Antioquia region inasmuch as they encourage dialogue between private organizations, government bodies and the community in general. Basically, the aim is for there to be joint responsibility between institutions and the community in their activities according to their functions and responsibilities.*

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**Mara Balvin**

WWF- Colombia

Intersectoral Specialist on Governance