



Improvement of navigation on the Magdalena River, Colombia

Shaping our world

## Water

With more than 100 years of experience, Tractebel provides high level engineering solutions to public and private organisations for the implementation and operation of large infrastructures in the field of Hydropower, Water Resources, Water Supply and Sanitation.

Tractebel carries out its mission on the world market, with its diversity of cultures, languages and climate conditions, by listening to and understanding every one of its Customers and Partners.

Developing, planning, designing and supervising the construction of water projects require multi-disciplinary engineering skills. Our specialists have acquired their know-how and expertise over several decades of extensive experience of implementing all sizes of projects around the world.

Our consultancy and engineering services encompass the entire life cycle of a project from conceptual or early planning studies through construction and commissioning of schemes up to operation support and rehabilitation. It includes not only state-of-the-art engineering services but also advisory services to accompany the development of your project.

**Tractebel, your water engineering & advisory partner.**



### AREAS OF EXPERTISE

- ▶ **Water Resources and Climate Change**
  - Climate change resilience and adaptation
  - Sustainable river basin development
  - Hydrology and floods
  - River hydraulics
  - Sediment management
  - Irrigation
- ▶ **Hydraulic Infrastructures**
  - Waterways, locks and ship lifts
  - Dams
  - Geotechnics and underground works
  - Water transfers and pumping stations
- ▶ **Hydropower**
  - Large hydropower projects
  - Micro and small hydropower projects
  - Pumped storage plants
  - Hydro and electromechanical equipment
- ▶ **Coasts, Ports and Marine Facilities**
  - Hydrometeorological hazards
  - Coastal erosion and estuarine flood management
  - Ports and terminals
  - Dredging consultancy
- ▶ **Water Supply and Sanitation**
  - Water and wastewater treatment plants
  - Desalination
  - Water distribution networks
  - Wastewater collection & stormwater drainage
  - Effluent re-use
- ▶ **Digital Services**
  - Hydro-informatics and numerical modelling
  - Digital platforms for monitoring and forecasting
  - Industrial cybersecurity
- ▶ **Environmental and Social Consultancy**
- ▶ **Economic, Financial and Transaction Advisory**

## OUR ORGANISATION

Home to five of the world's leading water engineering companies, Tractebel is a global player in the sector. Combining the skills of these unique companies makes Tractebel your truly reliable partner for realising any of your water projects, wherever they are.



LEME Engenharia



## OUR FULL LIFECYCLE SERVICES

### → STRATEGY & PLANNING

- Master plan
- Resource mapping
- Market analysis
- Institutional, regulatory and policy advisory



### PROJECT PREPARATION



- Pre-feasibility and feasibility
- Due diligence and risk analysis
- Environmental and social impact assessment and mitigation plan
- Economic and financial analysis
- Project structuring and private sector participation

### ← OPERATION

- Advisory services for operation and maintenance
- Risk management
- Infrastructure safety assessment and surveillance
- Rehabilitation and upgrading
- Digital platforms for monitoring

### ← PROJECT IMPLEMENTATION

- Project and contract management
- Tender documents and assistance to contracting
- Construction design
- Construction supervision and design review
- Equipment manufacturing quality control and assistance to commissioning
- Capacity building programmes



### ← TRANSACTION

- Technical assistance
- Financial modelling and advisory
- Assistance to contractual and commercial negotiations
- Assistance to permitting and licensing

## SELECTED REFERENCES

### Water Resources & Climate Change

- Nepal, flood hazard project** of 25 major river basins, pre-feasibility studies with climate change scenarios, 2015-2016
- Belgium, quantifying and mapping of drought as impact of climate change**, 1.3 million ha hydrologic drought modelling, 2018-2019
- Sri Lanka, Mahaweli water security investment programme**, 103,000 ha irrigation and drinking water project, detailed design, construction supervision, institutional development and environmental assessment, 2015-2020
- Namibia, Oshakati**, design of drainage and flood protection dykes to protect the city, 2011-2014

### Hydraulic Infrastructures

- Panama, third set of lock complex**, reference design of locks, hydraulic modelling, technical assistance, review of design build & documents, 2002-2018
- Egypt, Assiut dam and ship locks**, layout studies, hydraulic modelling, EIA, geotechnical investigations, tendering and construction supervision, 2008-2017
- India, Song dam**, update of design project review, 148 m high concrete dam for water supply & ground water recharge, since 2018
- France, real-time traffic capacity and trajectory studies on the Seine-Nord**, 240 km network of inland waterways, since 2017

### Hydropower

- Ethiopia, Grand Renaissance**, 6,000 MW, design review and construction supervision, since 2012
- Brazil, Jirau HPP**, 3,750 MW, design, project management and construction supervision, 2008-2016

- Kyrgyz Republic, Toktogul rehabilitation**, 1,200 MW, assistance during tendering process, design review and site supervision, since 2016
- Morocco, Abdelmoumen pumped storage**, 350 MW, construction design review and assistance for site supervision, 2010-2015

### Coasts, Ports & Marine Facilities

- West Africa, coastal areas management programme**, disaster risk reduction and climate change adaptation measures for coastal erosion and flooding, 2016-2017
- Uruguay, Montevideo LNG terminal**, owner's engineer, site supervision, design of the marine infrastructure and dredging, detailed design breakwater & scour protection, environmental management, 2011-2012
- Singapore, TUAS terminal scour protection**, design of scour protection for a new quay wall including physical modelling and CFD modelling for propeller induced forces, 2015-2017
- Ecuador, Guayaquil channel sedimentation**, in situ measurements and numerical model to determine maintenance dredging volumes in a navigation channel, 2017-2018

### Water Supply & Sanitation

- Qatar, water security mega reservoirs**, implementation of the world's largest water reservoirs, 475 km of main transmission pipelines, since 2013
- Colombia, wastewater treatment plant Medellin**, 432,000 m<sup>3</sup>/d, design and advisory during construction, 2010-2018
- Uganda, waste water treatment plant Kampala and sewerage system**, 45,000 m<sup>3</sup>/d, design and construction supervision, 2010-2018
- China, Bayanaoer**, 100,000 m<sup>3</sup>/d waste water treatment plant and reclamation plant, 2011-2014

### Desalination

- Saudi Arabia, 8 sea water reverse-osmosis plants for SWCC**, 220,000 m<sup>3</sup>/day, owner's engineer since 2019
- Tunisia, 6 brackish water plants**, 32,500 m<sup>3</sup>/day, design review, tendering and construction supervision, 2017-2022

### Digital Services

- EcoPAM: Ecological Pro-Active Management tool**, is an online tool to forecast the impact of dredging plumes on sensitive areas, 2012-2019
- Colombia, operational decision support platform for the Rio Bogota**, platform to evaluate and adopt future qualitatively and quantitatively water planning strategies, 2015-2017

### Environment & Social Consultancy

- Brazil, Belo Monte HPP**, Environmental Impact Assessment Studies (EIA/EIAR) and Basic Environmental Plan, 2009-2016
- Malawi and Tanzania, Songwe river basin development programme**, strategic environmental and social assessment, specific ESIA's and RAPs, 2013-2015

### Economic, Financial & Transaction Advisory

- Senegal, concession contract and tariff framework for the Senegal River water resource availability**, update of legal, regulatory and tariff framework for water provision, 2018-2019
- Guinea, Souapiti HPP transaction services**, contractual advisory for developing the 450 MW greenfield project, 2016-2018