



# **ANNUAL REPORT ON ENVIRONMENTAL PROTECTION 2019**

**China Three Gorges Corporation**

# About the Report

## Time Frame

From January 1 to December 31, 2019. Part of the content may exceed the aforementioned time frame.

## Scope

This report covers the work related to environmental protection involved in the main business of CTG, excluding environmental protection in the projects the Corporation has a minority stake in.

## Definition of Environmental Protection

Environmental protection as described in this report not only includes management of the environmental impacts of the Corporation's activities, but also includes work related to such aspects as soil and water conservation, ecological restoration and energy saving.

## Terms of Reference

The terms "the Group", "the Corporation" and "CTG" which appear in this report all refer to China Three Gorges Corporation.

## Context of the Publication

The Corporation's annual report on environmental protection has been published for 15 consecutive years since 2006. The electronic versions can be downloaded from the official website of CTG.

## Data in the Report

The data referenced in this report is CTG's final statistical data for 2019.

## Reference Standards

This report mainly uses the following standards as reference:

- *Environmental Protection Law of the People's Republic of China* (as amended on April 24, 2014)
- *Guidelines for Drafting on Corporate Environmental Reports* (HJ 617-2011), National environmental protection standards of the People's Republic of China
- *Disclosure Mechanism for the Assessment of the Environmental Impact of Construction Projects*, the Ministry of Ecology and Environment of the People's Republic of China
- GB/T 36000-2015, *Guidance on Social Responsibility*, National Standard of the People's Republic of China
- *GRI Sustainable Development Report Standard*, the Global Reporting Initiative (GRI)
- *Hydropower Sustainability Assessment Protocol*, International Hydropower Association (IHA)

## Languages Available

This report is available in Chinese and English, and published in both a printed version and an online version. For the online version, please visit CTG's website at <https://www.ctg.com.cn/> to download. If a printed version is needed, please email [wang\\_pengyuan@ctg.com.cn](mailto:wang_pengyuan@ctg.com.cn) or call 86-10-57081675.

## Further Reading

More content is available on CTG's web page. Please log on to <https://www.ctg.com.cn/> to read it. Other related information concerning environmental protection can be found in the following documents:

- *Ecological and Environmental Monitoring Bulletin of the Three Gorges Project*
- *Annual Report of China Three Gorges Corporation*
- *Sustainability Report of China Three Gorges Corporation*
- *Social Responsibility Report of China Yangtze Power Co., Ltd.*
- *Social Responsibility Report of Hubei Energy Group Co., Ltd.*

## Goals for Improvement

- To gradually standardize the report compilation in accordance with *the Guidelines for Drafting on Corporate Environmental Reports* (HJ 617-2011), which is a national environmental protection standard of the People's Republic of China.
- To further improve environmental management, achieve more comprehensive and in-depth management of environmental responsibility, and enhance transparent disclosure of environmental information according to the requirements of GB/T 36000-2015 *Guidance on Social Responsibility*.
- To form an environmental practice disclosure system for hydropower development enterprises with Chinese features in accordance with the *Hydropower Sustainability Assessment Protocol* compiled by IHA, in light of realities in China and with findings from the studies of China's hydropower sustainability assessment guidelines.



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## Message from Top Management



**Lei Mingshan**  
Board Chairman



**Wang Lin**  
Director of the Board  
President

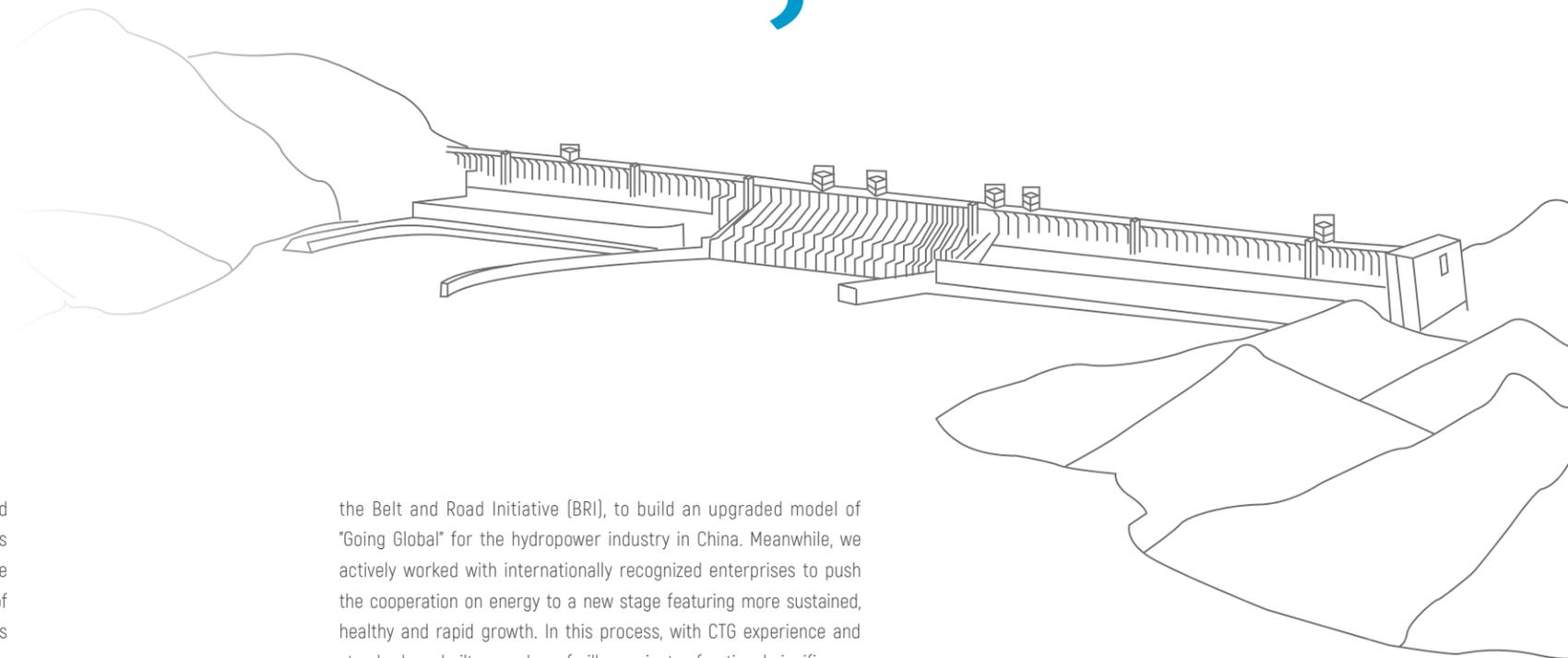
In this year, CTG played a leading role in advancing the joint protection of the Yangtze River and have registered solid progress. By doing so, we continued to improve the synergy and coordination in the five major platforms, and consolidated the efforts with the ministries, commissions, provinces and cities along the Yangtze River, and industry alliance in promoting the measures for the joint protection of the Yangtze River. Meanwhile, starting from urban sewage treatment, we have advanced the joint protection of the Yangtze River at four pilot cities, namely Jiujiang city of Jiangxi province, Yichang city of Hubei province, Yueyang city of Hunan province and Wuhu city of Anhui province, and other 12 cities including Chongqing municipality and Wuhan city. All these aim to explore a Three Gorges Mode of urban sewage treatment integrating governance structure, business vitality, cooperation scheme and joint development along the Yangtze River Economic Belt, to set an example of high-quality development of the Yangtze River Economic Belt.

In this year, remarkable achievements were made by CTG in ecological protection. We established a leading group for ecological protection,

draw up a list of ecological protection responsibilities and ensured the fulfillment of responsibilities at various levels. In the efforts to continue species protection and recovery, we worked with the Ministry of Agriculture and Rural Affairs of the People's Republic of China in the protection and rescue of the Chinese sturgeon as well as the protection of aquatic life in the Yangtze River. As a result, we now have a fair knowledge of artificial propagation technique of Chinese sturgeon, and succeeded in the propagation of rare and endemic fish such as Yangtze sturgeon, *Schizothorax prenanti*, *Percocypris pingi* and *Acipenser dabryanus*. Moreover, we ensured systematical progress in ecological restoration program of the Heishui River and completed the dismantling of Laomuhe gate dam. Xiluodu and Xiangjiaba HPPs passed the acceptance of environmental protection works, and were both listed as National Highlight Project on Water and Soil Conservation.

In this year, we continued to advance the large-scale development of new energy such as wind power, photovoltaic power and pumped storage power, and played our part in the joint efforts to pursue

The year 2019 was crucial for CTG to play its part in achieving progress in the joint protection of the Yangtze River. Crowned as the "Golden Belt" and the backbone of China's economy, the Yangtze River Economic Belt is closely associated with the overall landscape of safe, efficient and sustainable development of our country. Originated from the Three Gorges Project and rooted in the Yangtze River Basin, CTG comes with an innate mission to serve our country and people. For this reason, we have always been closely intertwined with the future and destiny of the country and were there at every step of the green development of the Yangtze River. We welcome and strive to achieve new missions and tasks entrusted by the State Council, put the joint protection of the Yangtze River in the first place of our development agenda and are making all efforts to live up to expectations from the country and our people.



the Belt and Road Initiative (BRI), to build an upgraded model of "Going Global" for the hydropower industry in China. Meanwhile, we actively worked with internationally recognized enterprises to push the cooperation on energy to a new stage featuring more sustained, healthy and rapid growth. In this process, with CTG experience and standard, we built a number of pillar projects of national significance in host countries overseas, which are recognized as exemplars and signature projects under BRI cooperation.

The year 2020 marks the last leg of the 13<sup>th</sup> Five-Year Plan (2016-2020) and the year to lay a solid foundation for the 14<sup>th</sup> Five-Year Plan (2021-2025). Everyone in the CTG family will bear in mind the instructions and guidance given to us by President Xi Jinping, stay committed to our original aspiration and mission, face challenges head-on when welcoming the new chapter. We will endeavor to follow through our two-pronged strategy where clean energy development and environmental protection of the Yangtze River go hand in hand, and build CTG into a world-class enterprise with global competitiveness.

# About Us



Based in Beijing, China Three Gorges Corporation (abbreviated as "CTG", referred to as "the Group" or "We") is a solely state-owned enterprise. Founded on September 27, 1993, we are formerly known as China Three Gorges Project Corporation, renamed "China Three Gorges Corporation" on September 27, 2009, and then restructured on December 28, 2017.

CTG's strategic positioning is as follows: We will actively support major national strategies such as the development of the Yangtze River Economic Belt and the construction of the Belt and Road Initiative, play a central role in the in-depth integration of the Yangtze River Economic Belt and the joint protection of the Yangtze River, create fundamental conditions for the promotion of regional sustainable development, and take the lead in promoting the upgrade, innovation and development of the clean energy industry. We will deepen the reform and accelerate the establishment of a world-class

clean energy group with strong innovative capability and global competitiveness.

With over 20 years' steady growth, CTG has developed into the largest hydropower development enterprise in the world and the biggest clean energy provider in China. As of the end of 2019, the main business of CTG has extended to engineering construction and consulting, power generation and operation, cascade dispatch and comprehensive management, new energy development and operation management, international energy investment and contracting, capital operation and financial service, assets management and base service, ecological protection investment and operation, etc.

Through earnestly implementing the mission mandated by our country of playing a leading role in the joint protection of the Yangtze River, we play an active role in building an ecological protection

sector, speeding up the formation of the entities, strengthening technological support and scaling up investment, to carry out pilot projects in the pilot cities with urban sewage treatment as the starting point.

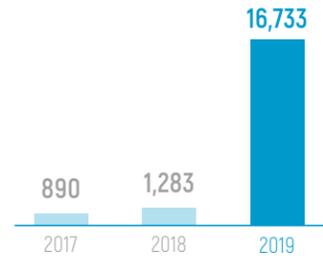
- CTG takes the full responsibility for the construction and operation of the Three Gorges Project
- According to the mandate given by the state, CTG is also responsible for the development, construction and operation of the four world-class giant cascade hydropower plants, i.e. Xiluodu, Xiangjiaba, Wudongde and Baihetan, in the lower reaches of the Jinsha River
- By the end of the 13<sup>th</sup> Five-Year Plan (2016-2020), the two hydropower plants of Wudongde and Baihetan will be built and put into operation successively. Five of the top ten hydropower plants in the world will be owned by CTG
- Over 2/3 of the world's hydro-generating units over 700 MW will be run by CTG

- CTG actively develops new energy businesses such as wind power and solar power, strives to make new energy business its second business pillar, and is committed to becoming a leader in offshore wind power
- CTG follows the national Belt and Road Initiative, accelerates the implementation of the "Going Global" policy, strives to upgrade the "Going Global" of China's hydropower. Overseas business has become an important growth engine for CTG's sustainable development

# Statistics of 2019



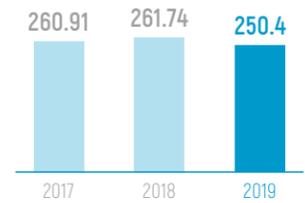
Total investment in environmental protection (including water and soil conservation) (RMB million)



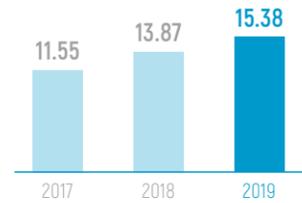
The implementation of environmental impact assessment for new projects (%)



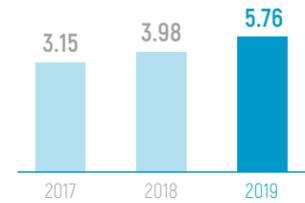
Total hydropower generation of CTG (TWh)



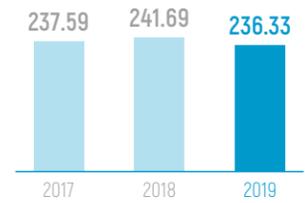
Total wind power generation of CTG (TWh)



Total solar power generation of CTG (TWh)



Total clean power generation of CTG (TWh)



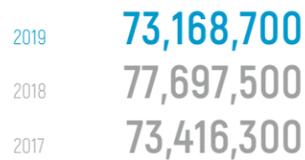
Proportion of renewable clean energy capacity in CTG's total installed capacity (%)



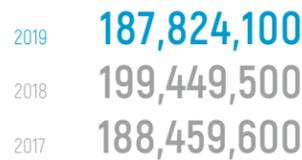
Proportion of CTG's consolidated hydropower in the national installed hydropower capacity (%)



equivalent to saving standard coal (tons)



equivalent to emission reduction of CO<sub>2</sub> (tons)



## Efforts of CTG for the Joint Protection of the Yangtze River in 2019

CTG's Leadership Group reviewed **85** proposals concerning the joint protection of the Yangtze River

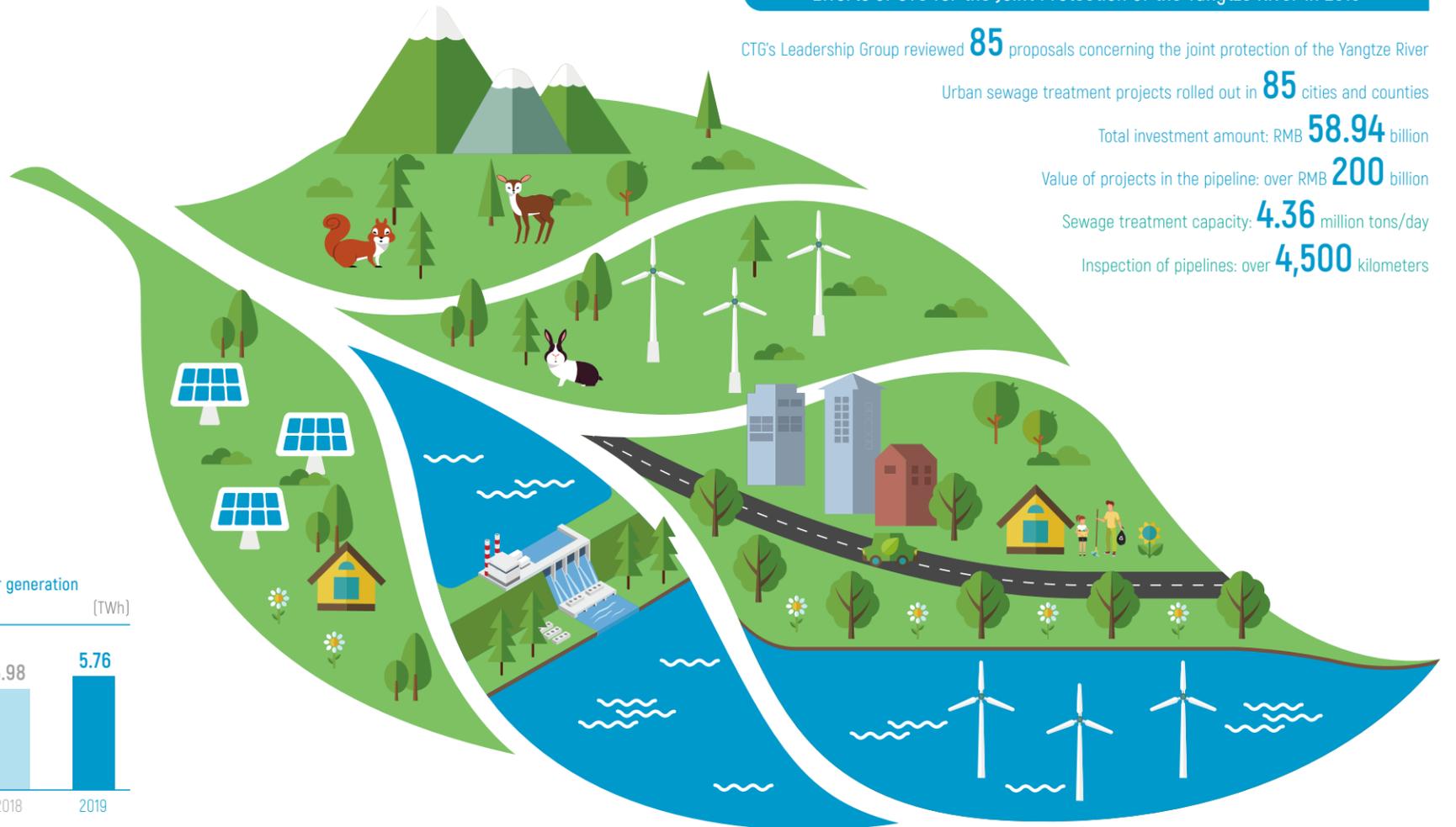
Urban sewage treatment projects rolled out in **85** cities and counties

Total investment amount: RMB **58.94** billion

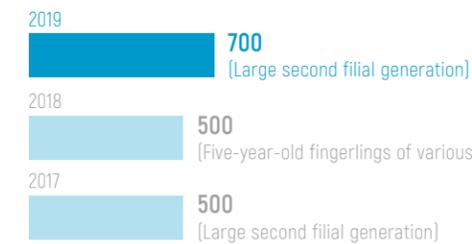
Value of projects in the pipeline: over RMB **200** billion

Sewage treatment capacity: **4.36** million tons/day

Inspection of pipelines: over **4,500** kilometers

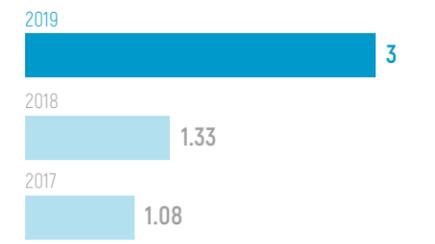


Number of Chinese sturgeon released into the Yangtze River



By the end of 2019, over **5.02** million Chinese sturgeon have been released into the Yangtze River.

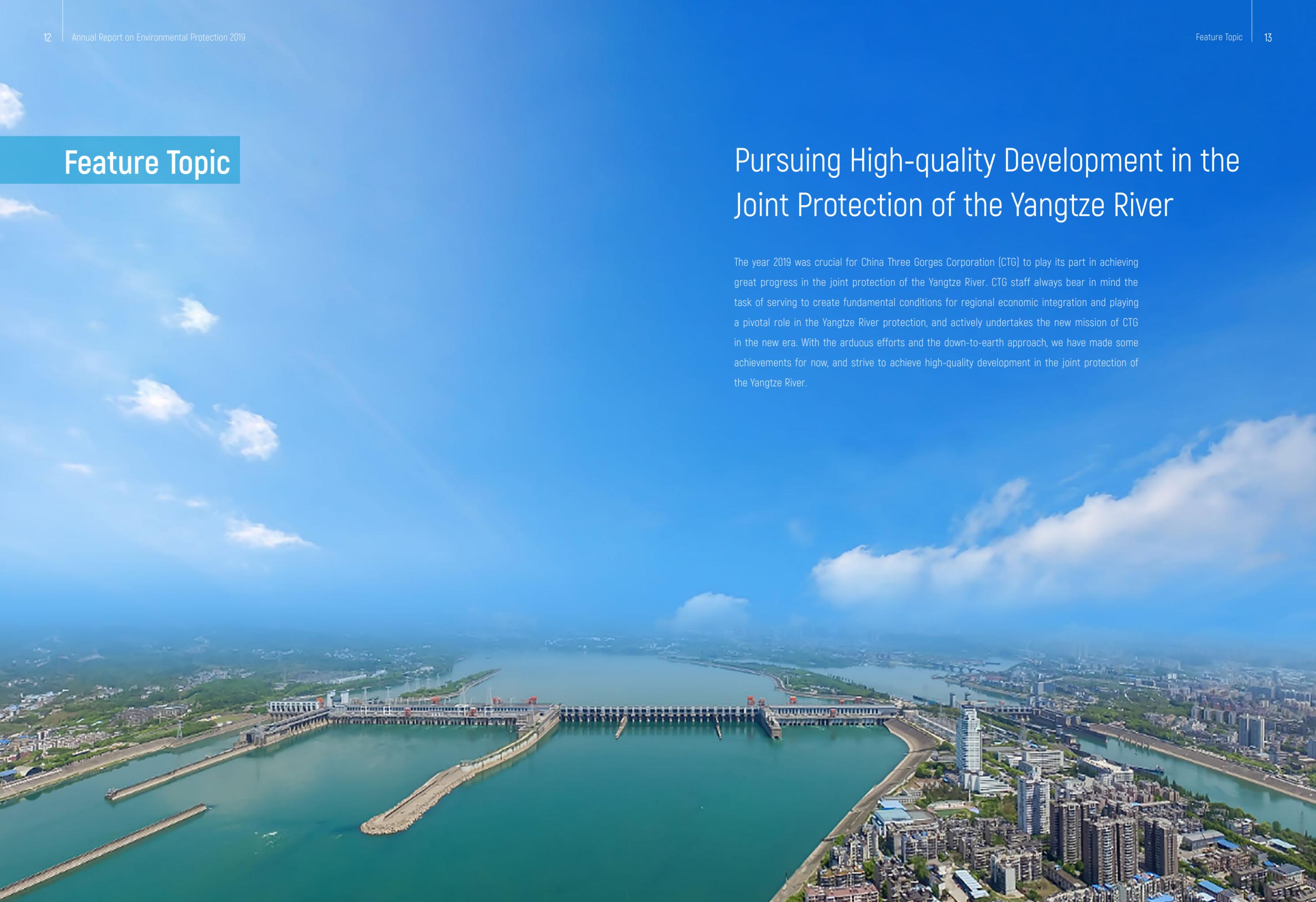
Total number of eggs spawned of the four major breeds of Chinese carp during the ecological operation experiment of Yidu section (billion)



## Feature Topic

# Pursuing High-quality Development in the Joint Protection of the Yangtze River

The year 2019 was crucial for China Three Gorges Corporation (CTG) to play its part in achieving great progress in the joint protection of the Yangtze River. CTG staff always bear in mind the task of serving to create fundamental conditions for regional economic integration and playing a pivotal role in the Yangtze River protection, and actively undertakes the new mission of CTG in the new era. With the arduous efforts and the down-to-earth approach, we have made some achievements for now, and strive to achieve high-quality development in the joint protection of the Yangtze River.



# Top-level Design to Advance the Implementation of Strategies

We proactively undertake the new mission and task in the new era with increased awareness on its significance and put the joint protection of the Yangtze River on top of our agenda. And we follow major strategies of our country and do our utmost to advance the joint protection of the Yangtze River to ensure solid outcomes to this end.

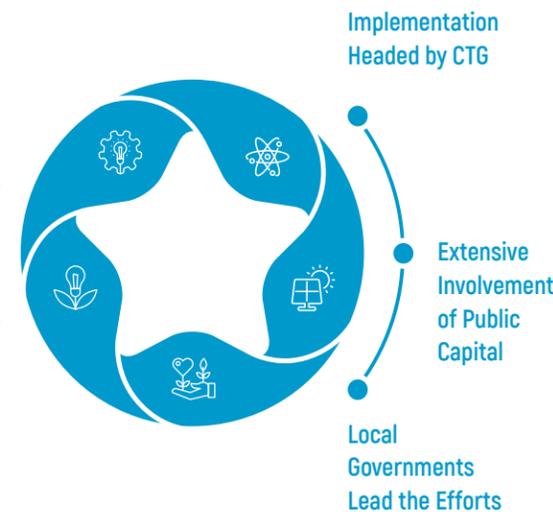
## Leadership Office for Advancing the Development of the Yangtze River Economic Belt



On June 5, 2019, in Wuhu city, Anhui province, the Leadership Office for Advancing the Development of the Yangtze River Economic Belt held a meeting to advance CTG's efforts in urban sewage treatment along the Yangtze River Economic Belt.

Leadership Office for Advancing the Development of the Yangtze River Economic Belt

Instructions by Related Ministries and Commissions



## Instructions by Related Ministries and Commissions



On February 28, 2019, in Beijing, CTG and the Ministry of Ecology and Environment of the People's Republic of China signed a strategic cooperation agreement for the joint protection of the Yangtze River.

## Implementation Headed by CTG



On October 17, 2019, Wang Lin, President of CTG, and Head of the Leading Group for the Joint Protection of the Yangtze River of CTG, presided over the 28<sup>th</sup> meeting of the Leading Group.

## Extensive Involvement of Public Capital



On June 5, 2019, the Yangtze River Protection Industry Alliance was established in Wuhu, Anhui province.

## Local Governments Lead the Efforts



On December 5, 2019, in Yueyang city, Hunan province, the Development and Reform Commission of Hunan Province organized the Presentation of Hunan Urban Sewage Treatment with participation of CTG along the Yangtze River Economic Belt.

## Coordinated Development to Pursue Shared Growth through Consultation and Collaboration

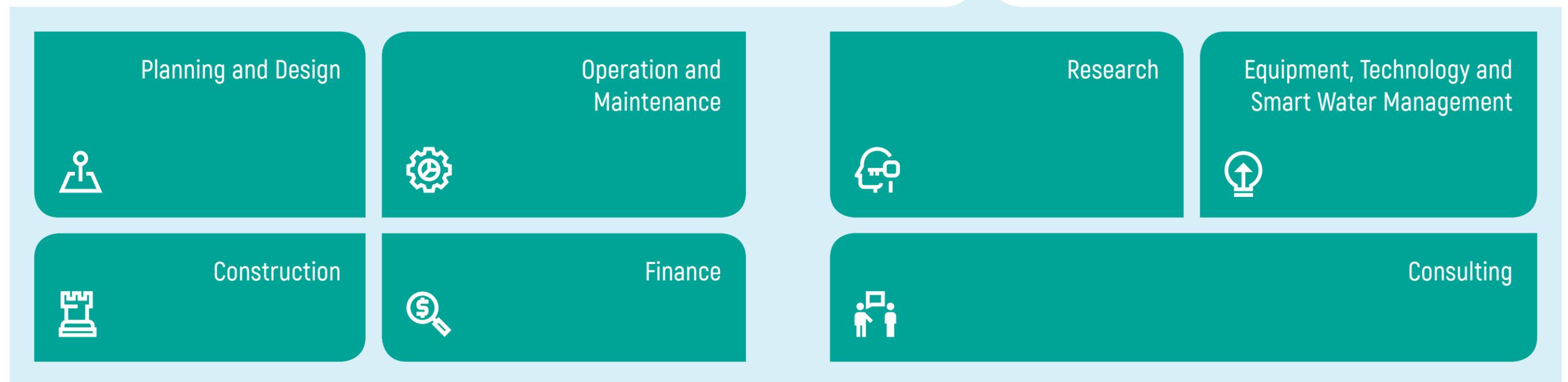
We continue to improve the coordinated development of the five major platforms. The Yangtze Ecology and Environment Co., Ltd. has taken shape and been in operation with clearly identified core competence. Moreover, we established the Yangtze River Protection Industry Alliance and the fund guarantee system, and financing for the first batch of projects was ensured.

We consolidated our efforts with the National Development and Reform Commission, ministries & commissions, governments at various levels of 11 provinces and cities along the Yangtze River and members of the Industry Alliance. In doing so, we have signed strategic cooperation agreements with 11 provincial-level governments and local governments along the Yangtze River, thus achieving the full application of the model of beginning with pilot projects for more extensive cooperation to realize a full-river-range implementation.

### Five Major Platforms for the Joint Protection of the Yangtze River by CTG



### Yangtze River Protection Industry Alliance



# A Comprehensive Plan that Starts with Pilot Projects

We advance the pilot projects in Jiujiang, Wuhu, Yueyang and Yichang at a quick pace, in an effort to spur larger-scale development with individual projects. For this reason, we have rolled out the "Three Gorges Mode" and applied the experience and practices in the provinces and cities along the Yangtze River, and added new cooperation projects with 12 cities and counties along the Yangtze River, thus further extending our experience to the whole Yangtze River Economic Belt.

Water governance outcome ensured by physical projects:

4

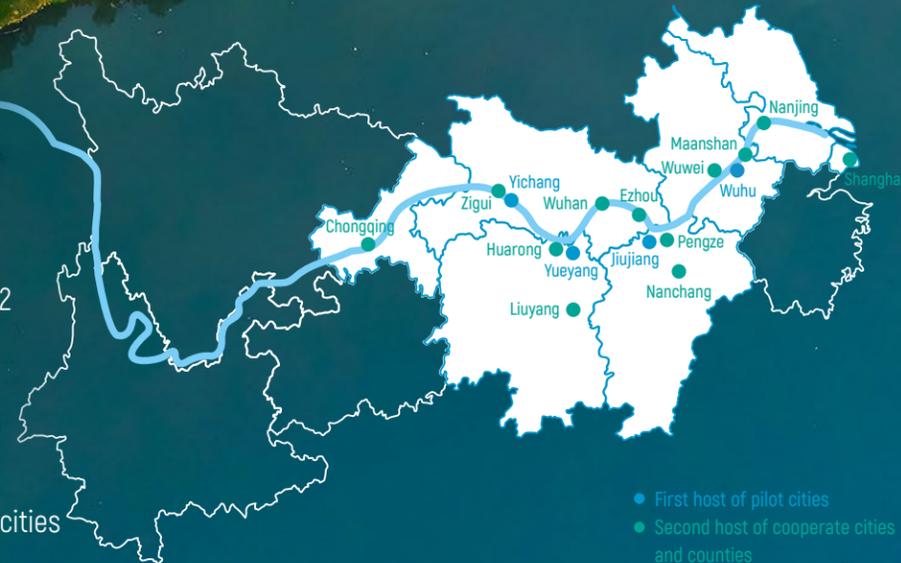
Start with 4 pilot cities

12

Extended cooperation in 12 cities and counties

85

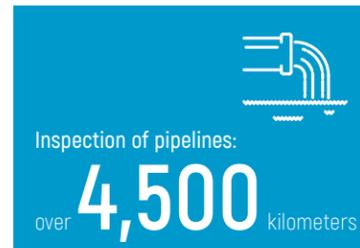
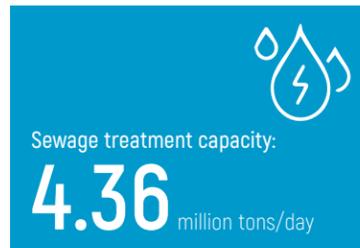
Full implementation in 85 cities and counties



## Sharing Experience with CTG Mode

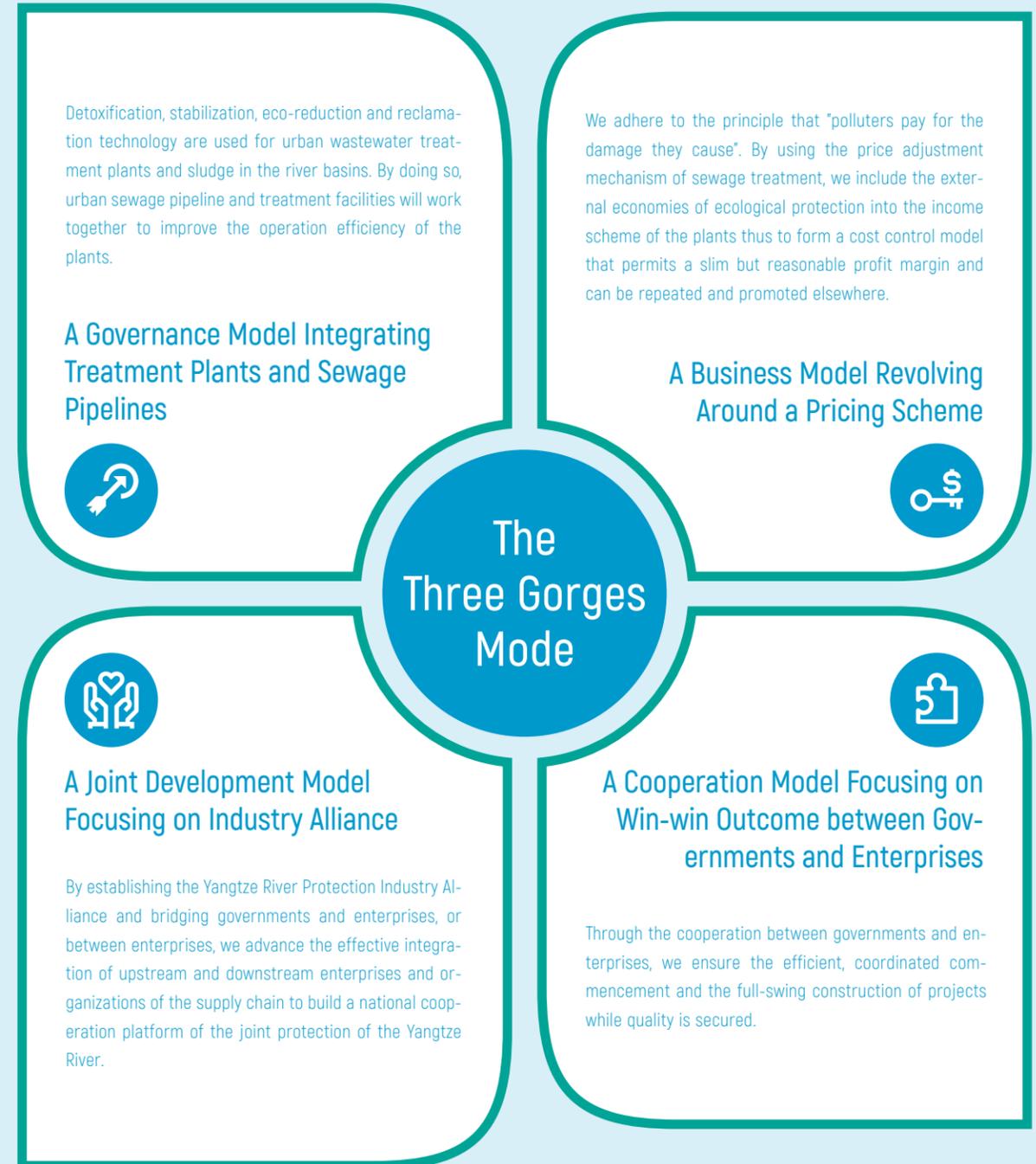
We have come up with a science-based water governance program in 163 Chinese characters. In the program, we established the "Three Gorges Mode" for urban sewage treatment along the Yangtze River Economic Belt, the one focusing on a governance model integrating treatment plants and sewage pipelines, a business model revolving around a pricing scheme, a cooperation model of win-win outcome for both governments and enterprises, and a joint development model of industry alliance. This Three Gorges Mode has been recognized by and extensively applied in the provinces and cities along the Yangtze River.

By the end of 2019



### The Three Gorges Mode - A Science-based Water Governance Program

The protection of Yangtze River begins with urban sewage treatment, and one must clarify the reality he faces, the resources available and the problems to solve. The work must be based on the total amount of pollutants to be treated and guided by a systemic master plan that revolves around the principle of river-basin-scale thinking with coordinated efforts to realize a systemic management method that addresses both the symptoms and root causes. Each city should have a tailored plan of its own that answers to its specific needs, a plan that features overall benefits and scale operation and guides project investment, construction and operation with methodologies that integrate sewage plants, pipelines, rivers, lakes and banks, that the treatment of sewage and sludge goes hand in hand, that emphasize resources and energy recycling, and that encompass the full-cycle of projects throughout construction, operation and maintenance. The work should aim to collect urban sewage in full, to treat, up to standard, all that is collected and to utilize it comprehensively. In this way, the quality of urban water environment can be fundamentally improved in its entirety.



# Ecological Protection to Make the Yangtze River Clear Again

We adhere to the efforts for ecological protection in the process of clean energy development, strengthen ecological protection and restoration in the basin and carry out ecological operation of cascade reservoirs. Meanwhile, we carry out the protection and restoration of the habitats of rare and endemic fish, constantly conduct artificial propagation and releasing, and protect rare and endemic plants in the Yangtze River Basin. Moreover, we earnestly ensure our efforts for soil conservation in the process of project development and strive for a harmonious unity of ecological benefits, economic benefits and social benefits.

## Protection of Rare and Endemic Animals in the Yangtze River Basin

In April 2019, the Chinese Sturgeon Research Institute of CTG, through induced spawning on three occasions, helped 20 female and 4 male Yangtze sturgeon to realize artificial propagation. As a result, over 330,000 fertilized eggs were produced, over 50,000 fish fries hatched and over 10,000 fingerlings bred. Among them, over 9,000 fingerlings were released into the river section of Xiangjiaba HPP in 2019, effectively increasing the wild population of Yangtze sturgeon.

## Protection of Rare and Endemic Plants in the Yangtze River Basin

In 2019, the Yangtze River Rare Plant Research Institute visited the original habits of plants, such as shoals, dense forests and slopes. On the site, we surveyed and recorded various indicators such as soil quality, climate conditions and plant distribution. Meanwhile, we used the cutting-edge technologies and achieved large-scale reproduction of plants to help the study of rare plants and their reproduction. We also took the initiative to shoulder the responsibility of safeguarding "Species Gene Pool" of the Yangtze River.





Ecological Restoration Result of the 185 Platform

### Terrestrial ecological restoration in the Three Gorges dam area

The Yangtze River Rare Plant Research Institute proactively advances the terrestrial ecological restoration in the Three Gorges Dam Area, including the governance of drawdown zone, the ecological restoration of slag quarries in the construction area and bank protection along the basin. We established the Rare and Endemic Plant Scientific Research Demonstration Area at the 185 Platform and the Vegetation Management Experiment Area at the Pianyanzi drawdown zone to bring a brand-new look to the Three Gorges Dam Area.

### Ongoing efforts for ecological restoration of fish habitats in the Heishui River

In 2019, we carried out the ecological restoration of fish habitats in the Heishui River. The efforts to this end include dismantlement of the dam, dismantlement of sluices and blocking of water intake, dismantlement of dam management facilities and blocking of water inlet to the power house. In May 2019, the removal of the dam was completed, effectively restoring the connectivity of the Heishui River course.

As one of the major measures for ecological restoration of fish habitats in the Heishui River, for the trail river section with a length of about 2 km, ecological restoration program improves the flow conditions via dredging at some river section and permeable dam. In addition, this program provides suitable aquatic habitats for the fishes in the reservoir through simulating natural habitat, to build this program into a testing ground for ecological protection of fish habitats.



Before the Removal of Laomuhe Gate Dam



After the Removal of Laomuhe Gate Dam



Our Professionals Collecting the Eggs of the Chinese Sturgeon

### Joint ecological operation among three reservoirs enabled the amount of the eggs of the four major breeds of Chinese carp to reach a new high

The year 2019 marked the success in the joint trial ecological operation among Xiluodu, Xiangjiaba and the Three Gorges reservoirs. During the operation, at the lower reaches of Xiangjiaba and Gezhouba reservoirs, the eggs laid by drifting spawning fish were found. And at the Yidu section, the total amount of the eggs of the four major breeds of Chinese carp reached 3 billion, creating a new record.

### Carrying out protection of the aquatic life by working with the Ministry of Agriculture and Rural Affairs

On November 2, 2019, we deepened the cooperation with the Ministry of Agriculture and Rural Affairs on the restoration of fishery resources in Xiangjiaba reservoir area and the protection of rare and endemic species of the Yangtze River. On the basis of the outcome of the first round of projects, we focus on the 14 items of five categories such as protection and restoration planning, protection of key rare species, habitat restoration, system of assessment and evaluation indicators as well as publicity and training activities, to put in place the restoration of fishery resources and the protection of rare and endemic species of the Yangtze River.



# 01

## Environmental Management

CTG is the largest hydropower developer in the world and the largest clean energy provider in China. Giving priority to ecological protection in the whole process of investment, construction and operation of clean energy, we constantly strengthen the basis of environmental management, make innovations in environmental protection technologies and enhance the capacity in environmental protection, to speed up the building of a world-class clean energy group with strong innovative capability and global competitiveness.

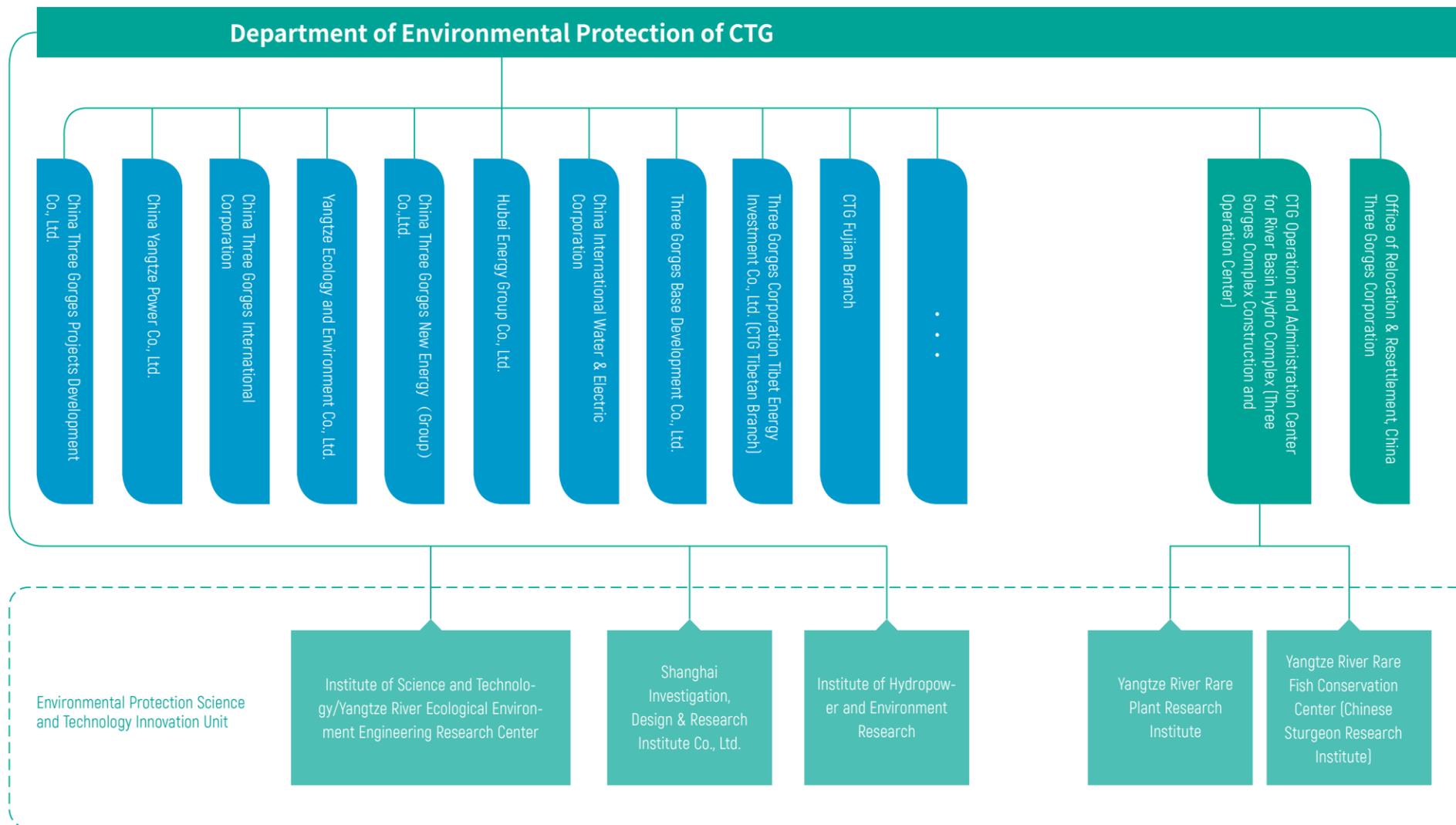
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# Organizational Structure

Hierarchical management and control are applied for environmental protection of CTG, covering the whole business scope, whole river basin and whole process.

## Organization System of CTG's Environment Protection Management



# Management System

CTG keeps improving its environmental management system, that is interdependent with the quality, environmental, and occupational health and safety management system, environmental management mechanism, comprehensive risk management system, internal control system and environmental emergency management system.

## Environmental Management System

CTG has established a sound environmental management system that strengthens the responsibility of everyone on the job and internal auditing. We constantly review our work so we can fill in the gaps and make up where needed to improve our environmental management capability. In 2019, CTG completed the internal and external audits of the environmental management system for ISO 14001, and obtained the new version of the GB/T 24001-2016/ISO 14001-2015 environmental management system certificate.



## Regulations on Environment Management

The environmental protection management system of CTG covers environmental management in the early stages and construction period of projects, acceptance management of environmental protection facilities, environmental protection management in the operation of Three Gorges Hydropower Complex and power generation, environmental protection research, monitoring and data collection, management supervision, etc.

## Environmental Risk Management

CTG periodically identifies environmental risk factors in the fields of hydropower, wind power, solar power and thermal power, as well as in the domains of energy resource management and pollutant discharge management. By doing so, we can identify the major environmental risk factors and draw up risk management strategies accordingly. In 2019, no major environmental pollution incident occurred, with environmental risks under control.

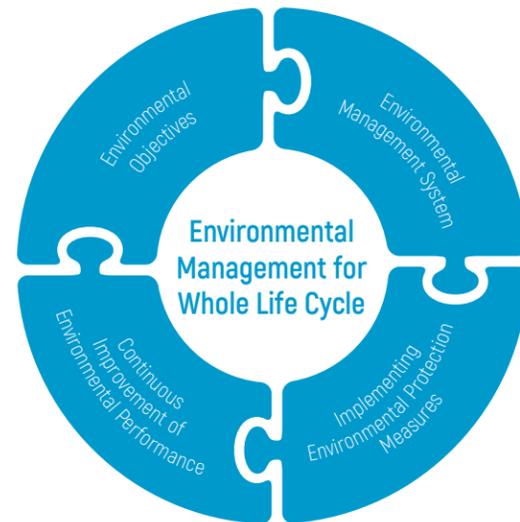
## Environmental Emergency Management System

CTG keeps improving the emergency management system. Contingency plans are implemented under the principles of local administration, hierarchical responsibility, classified guidance, comprehensive coordination and dynamic management. Training and drilling for contingency plans are frequently organized to improve our ability to deal with major environmental risks. According to CTG's emergency management system, each entity establishes its own comprehensive contingency plan, special contingency plan and on-site handling plan, forming a comprehensive emergency response system with well-balanced and coordinated structure that reaches every corner of CTG's business.



## Process Management

CTG implements environmental management for the whole life cycle, including setting environmental objectives, establishing and improving an environmental management system and implementing environmental protection measures. It also implements closed-loop environmental management and realizes continuous improvement of environmental performance.



## Programming and Planning

CTG takes into account the research progress of the corporation's reform plan and the needs of environmental protection work, organizes and compiles the annual environmental protection plan of CTG, promotes the implementation of environmental protection projects, and tracks and manages the plan.

## Supervision and Inspection

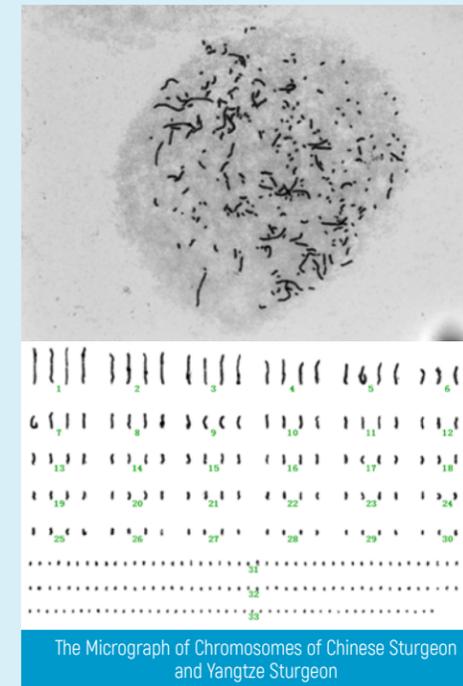
We expand the external supervision channels and subject ourselves to the supervision and inspection made by environmental protection authorities at various levels. In addition, on the official website, we set up a platform for the feedback from the public about environmental protection, placing our work under public scrutiny.

## Scientific and Technological Innovation

We use innovation to drive the efforts of environmental protection and the upgrading of environmental protection level. We take the lead in green development of hydropower industry via CTG Standard, and continue to enhance R&D capacity in environmental protection technologies of a number of environmental protection research institutes such as the Yangtze River Rare Fish Conservation Center and the Yangtze River Rare Plant Research Institute.

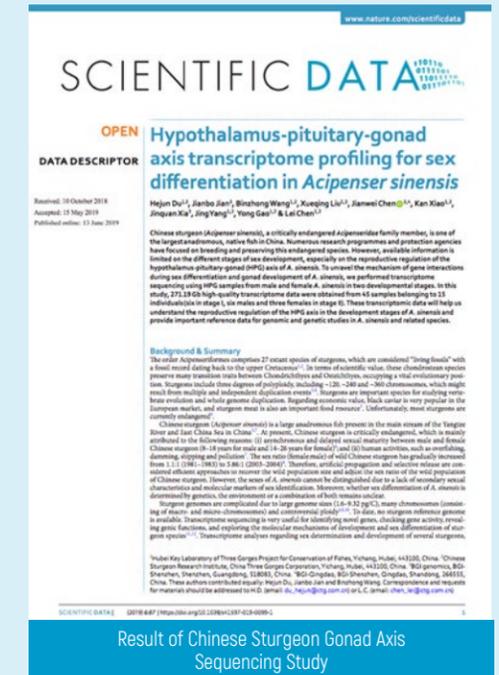
### New progress in karyogram technology of sturgeons

In 2019, we grasped the technology of preparing chromosomes of Chinese sturgeon and Yangtze sturgeon, succeeded in making the micrograph of the chromosome of Chinese sturgeon for the first time and created the karyogram of Chinese sturgeon. The number of chromosomes of Chinese sturgeon is determined as 264, laying a technological foundation for detecting genetic conditions of Chinese sturgeon and Yangtze sturgeon from the cellular level.



### Completion of the study on gonad axis transcriptome of Chinese sturgeon

In 2019, we completed the study on gonad axis sequencing of Chinese sturgeon, finding the difference of male and female on transcriptional profiling after early development and sex differentiation, and developed early prenatal sex determination method. The study result was published in an international journal under *Nature*.



The Micrograph of Chromosomes of Chinese Sturgeon and Yangtze Sturgeon

Result of Chinese Sturgeon Gonad Axis Sequencing Study

## Cooperation and Exchange

CTG actively shares information on the achievements of environmental protection and advanced concepts and ideas with other actors in the industry. High-level platforms of international exchanges and communication are fully utilized to contribute our experience gained from the Three Gorges Project in achieving sustainable development of clean energy industry and advancing the UN Sustainable Development Goals (SDGs) and the *Paris Agreement*.



### Attending High-Level Forums

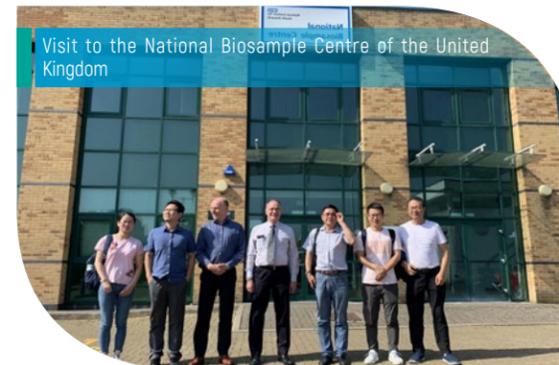


Meeting with the Visiting Minister of Environment and Energy Transition of Portugal



Meeting with Zambian Ministerial Delegation

### Special Investigation



Visit to the National Biosample Centre of the United Kingdom



Visit to the Medical Biobank at the University of Würzburg

### Technological Exchanges and Cooperation



Co-sponsoring the Forum on China Hydropower Development 2019



Meeting with the President and CEO of Vestas

### Cooperation with International Organizations



Participating in the First UNESCO International Water Conference and Giving a Speech



Giving a Speech at the Hydro 2019

# 02

## Green Products

As the largest hydropower developer in the world and the biggest clean energy provider in China, CTG always maintains strategic focus, firmly sticks to clean energy development, and is a pacesetter in the transformation and upgrading of clean energy industry, to inject impetus into low-carbon green development for the economy and society.

Focusing on Hydropower Development	36
New Energy Business Expansion	38
Eyeing an Global Business Landscape in the Energy Industry	40



## Focusing on Hydropower Development

CTG makes clear the two-pronged strategy where clean energy development and environmental protection of the Yangtze River go hand in hand. We vigorously advance the development of two large-scale hydropower plants, namely Wudongde and Baihetan HPPs. Moreover, we speed up building up a fleet of hydropower projects overseas through leveraging our advantages in hydropower development, to share with other hydropower industries around the world the experience and the expertise gained from the Three Gorges Project.

By the end of 2019,

Consolidated installed capacity of hydropower:

**49.45** GW in China

**8.894** GW outside China



Total hydropower capacity accounted for 13.9% of the whole nation

Total hydropower generation:

**250.4** TWh

including

**216.74** TWh in China

### Marked overall benefits of the Three Gorges Project

During the flood season, the primary task of the Three Gorges Project is flood control for the lower reaches of the Yangtze River to guarantee safety for the Yangtze River Economic Belt. Through integrated operation of the cascade reservoirs, we play an active role in optimizing the dispatch for medium and small floods. During the dry season, with the help of the Three Gorges Project, the flow of the Jingjiang River is raised to over 6,000 m<sup>3</sup>/s and the navigation conditions of the Yangtze River is greatly improved via impoundment to ensure the navigation security of the Golden Waterway - the Yangtze River. Meanwhile, the Three Gorges Reservoir, as the largest strategic freshwater reservoir in China, provides water for households, industries and for ecological purposes, thus providing safety guarantee for the development of Yangtze River Economic Belt.



Flood control

Impoundment of  
**9.32** billion m<sup>3</sup>  
in total for the lower reaches  
in 2019



Navigation

Volume of freight  
**146** million tons  
through the Three Gorges ship locks  
in 2019



Power generation

**96.877** TWh  
in 2019



Water replenishment

**23.25** billion m<sup>3</sup>  
water replenished for the lower reaches  
in 2019

## New Energy Business Expansion

We uphold the philosophy of green development, take into consideration economic and environmental factors and maximize the environmental value through green investment and environmental industries. We also proactively engage in renewable business with a strategic priority on offshore wind, and explore the practice of replacing fossil fuel with clean energy.



By the end of 2019,

Consolidated installed capacity of wind power:

**6,813** MW in China

**437** MW outside China

Total wind power generation:

**15.38** TWh

including **13.86** TWh in China



By the end of 2019,

Consolidated installed capacity of photovoltaic power generation:

**4,718** MW in China

**18** MW outside China

Total photovoltaic power generation:

**5.76** TWh

including **5.73** TWh in China



### "Blue Lake" at Gobi Desert

Golmud Photovoltaic Pioneer Project is the largest photovoltaic project built in one go in China, with a total installed capacity of 500 MW and an area of 771 hectares. Its designed average annual power generation is about 900 GWh, an amount equivalent to a broad-leaved forest of 2,074 hectares or an annual reduction of standard coals about 277,000 tons, a reduction of CO<sub>2</sub> emission 757,000 tons, a reduction of SO<sub>2</sub> emission 423,000 tons and a reduction of smoke emission 54 tons. And the power generation of this project can meet the power needs of 567,000 urban and rural households.



amount equivalent to a broad-leaved forest of

**2,074** hectares



annual reduction of standard coals about

**277,000** tons



reduction of CO<sub>2</sub> emission

**757,000** tons



reduction of SO<sub>2</sub> emission

**423,000** tons

## Eyeing an Global Business Landscape in the Energy Industry

We play an active role in serving the national strategy of "Going Global" and the Belt and Road Initiative (BRI), strive to build an upgraded model of "Going Global" for China's hydropower industry, and work to be a pacesetter of "Going Global" for the complete industrial chain of China's hydropower industry.



In 2019, overseas power generation:

**35.21** TWh

As of the end of 2019, our business extended into

**47** countries and regions across the world



### Initial impoundment of Souapiti Hydropower Complex

Souapiti Hydropower Complex of the Republic of Guinea is the first large-scale hydropower project developed in the PPP model by China International Water & Electric Corp. in the Republic of Guinea. For this hydropower complex, the installed capacity is 450 MW, annual power generation 1.899 TWh, concrete pouring 3.6 million m<sup>3</sup>, the length of dam axis 1,164 m and maximum dam height 120 m. Consequently, it is crowned as the Three Gorges Project of West Africa.

installed capacity is

**450** MW

annual power generation

**1.899** TWh



### Isimba Hydropower Plant - the Pearl on the White Nile

Uganda Isimba Hydropower Plant is a project developed in the EPC model by China International Water & Electric Corp. in light of the hydrology conditions of the White Nile. The installed capacity of this project is 183 MW, accounting for about 18% of the total installed capacity in Uganda after being put into operation. It has an average annual power generation of 1.039 TWh, realizing an increase of about 22 percent in total power generation in Uganda and markedly improving the current conditions of power generation for industry and residential electricity consumption in Uganda. On April 12, 2019, Uganda Isimba Hydropower Plant was completed and officially handed over to Uganda.

# 03

## Clean and Low-carbon

While developing clean energy in a science-based manner and actively building the system of clean and efficient energy, we incorporate low-carbon concept into the whole life cycle of project planning, development and operation, aiming to minimize the impact of the project on the environment and make contributions to coping with or mitigating climate change via clean and low-carbon development.

Reduction in Carbon Emission	44
Reduction in Wastewater Discharge	45
Reduction in Air Pollution	46
Disposal of Solid Waste	47



## Reduction in Carbon Emission

We vigorously carry out carbon emission management to promote direct or indirect carbon emission. Moreover, we play an active role in developing hydropower resources and constantly upgrading dispatch, to give full play to the comprehensive benefits of cascade hydro-complexes, such as flood control, water replenishment and ecological protection. Moreover, we work hard to reduce the total carbon emission and carbon emission intensity, and are engaged in carbon trading, to play our part in coping with global climate change.

### Leveraging freshwater resources for ecological replenishment

During the water drawdown, the cascade reservoirs ensure continuous replenishment to the lower reaches of the Yangtze River. In 2019, four cascade reservoirs along the mainstream of the Yangtze River achieved a replenishment of 33.09 billion m<sup>3</sup> in total, thus ensuring the water for households, industries and ecological purposes along the Yangtze River and effectively leveraging the role of the Three Gorges reservoir as the freshwater resources.



### Carbon emission management carried out by CTG Brazil

CTG Brazil registered Rio Paranapanema's Carbon Emission in the Brazilian GHG Protocol Program, and has them audited by a third party and received the Golden Stamp of Quality.

## Reduction in Wastewater Discharge

We strictly implement the "Three Simultaneities" system of environmental protection, intensify the efforts of domestic wastewater and industrial wastewater treatment, strengthen project operation management, and make improvement in wastewater treatment facilities and innovation in wastewater treatment technology, to ensure that wastewater is discharged in accordance with standards.



Automatic Slag Removal Machine Installed before the Primary Sedimentation Tank of Xincun Sewage Treatment Station



Chiwu Sewage Treatment System of Changlongshan HPP

### Effective treatment of wastewater of various sources in the Three Gorges Complex area

It takes CTG 7 months to complete the permanent treatment project of wastewater from 14 sources on both left and right banks of the Three Gorges Area. To this end, the rain sewage pipeline of over 15,000 meters was laid and over 300 manholes of various types were built. In addition, 20 oil interceptors and septic tanks were made and 4 sets of integrated equipment for sewage treatment were installed, thus achieving 100 percent treatment of wastewater from various sources.

## Reduction in Air Pollution

Through strictly implementing air pollution treatment measures, we effectively control and reduce air pollutants such as vehicle exhaust and construction dust to keep our skies blue.

### Phase III Project of Hubei Energy Group's Ezhou Power Plant aligns with the most stringent standards of environmental protection in the world

To further advance the development of clean and efficient thermal power projects, 2×1,000 MW generating units in Phase III project of Ezhou Power Plant adopts the most advanced ultra-low smoke emission technology in the world, with a total investment of up to RMB 1.421 billion for environmental protection. The design threshold values of smoke, CO<sub>2</sub> and nitrogen oxide emission concentration are 5 mg/m<sup>3</sup>, 35 mg/m<sup>3</sup> and 50 mg/m<sup>3</sup> respectively. The two generating units were put into service in April and June of 2019, with air pollutant emission meeting design requirements.

## Disposal of Solid Waste

We devote to the cleaning of floating debris in hydro-complex areas and the areas near the dams. Built on the successful cleaning of floating debris and bio-safety disposal for multiple years in the Three Gorges Reservoir, we work hard to apply such practices in Xiangjiaba and Xiluodu HPPs to effectively ensure clean water in the reservoirs and avoid adverse impact of floating debris on the operation of power stations, ship locks and ship lifts.

In 2019

Total floating debris cleaned in the Three Gorges Reservoir:

**58,000** m<sup>3</sup>

Total floating debris cleaned in Xiangjiaba HPP:

over **2,800** tons



# 04

## Resource Conservation and Recycling

CTG actively promotes resource conservation and recycling. Through lean production management and technological innovation, it improves resource utilization and minimizes resource consumption and energy consumption.

Cutting in Energy Consumption	50
Recycling	50



## Cutting in Energy Consumption

We reduce energy waste and enhance energy utilization efficiency through strengthening the management of equipment and facilities, introducing new materials and new technologies, and advocating the model of green office, to advance a harmonious unity of self-development and environmental protection.

20

new energy vehicles were added

saving

250,000

liters of oil



### Strengthening equipment management to reduce energy waste

Three Gorges Base Development Co., Ltd. (TGBD) strengthens the management of equipment and facilities at production and business entities such as hotels, scenic spots and transportation. For the vehicles of operation, priority is given to new energy to reduce fuel consumption. In 2019, 20 new energy vehicles were added, saving 250,000 liters of oil.



## Recycling

We effectively enhance the efficiency of resource utilization, strengthen precise management and accurate control of water resources, reasonably control water level in the reservoirs by considering inflow forecast, and upgrade the load distribution of generating units to promote water saving for power generation. In 2019, a replenishment of 33.09 billion m<sup>3</sup> was provided to the lower reaches of the Yangtze River by the cascade reservoirs, ensuring water supply for households, industries and ecological purposes along the Yangtze River and effectively leveraging the role of the Three Gorges reservoir as the freshwater resources.



Soil Improvement Made by TGBD

### Landscaping at Baihetan turns the waste into organic fertilizer

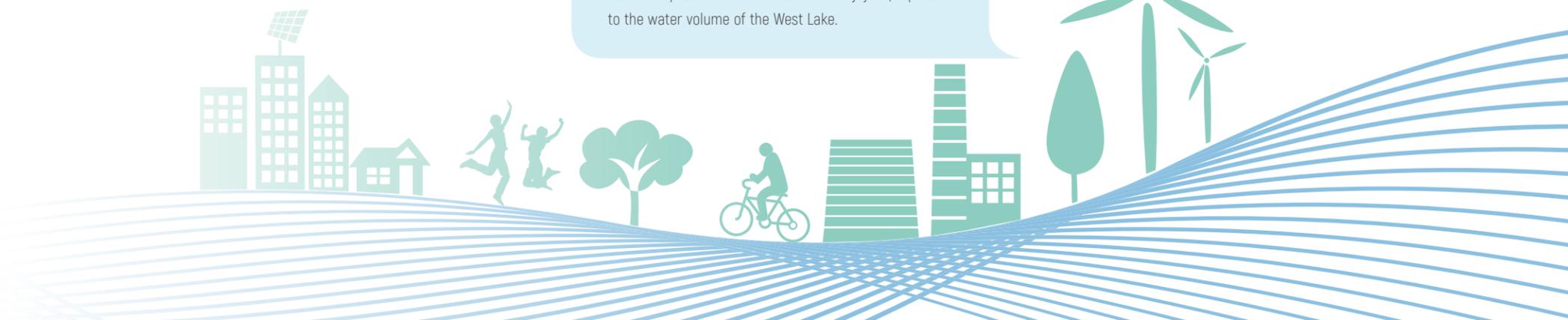
About 400,000 m<sup>2</sup> of green space is ready at the construction area of Baihetan HPP, with about 100 tons of garden waste produced every year. Because the capacity of the landfill is limited, there is no place for disposing waste after landscaping due to limited capacity of the landfill. TGBD follows the philosophy of science-based environmental protection and resource regeneration and makes investment in ecological treatment workshop of waste after landscaping. As a result, the waste after landscaping is turned into valuable organic fertilizer via rapid treatment method by enzyme reaction, delivering the maximal economic, social and environmental benefits.

### The wastewater recycled at Baihetan HPP is equivalent to the water volume in the West Lake

Through the upgrading and renewal of the treatment facilities of production wastewater at the Baihetan HPP, wastewater from the concrete system at high-low lines of the dam, sand processing and tank car flushing is completely recycled. And the wastewater from concrete mixing system, after treated by a three-level sedimentation tank, is used for water sprinkling and dust control on the ground. As a result, about 13 million tons of water for production can be saved every year, equivalent to the water volume of the West Lake.

### Utilization of medium and small floods

From July 1 to September 10, 2019, the average water level was 558.26 meters in Xiluodu Reservoir, representing a relatively low inflow. At the time of "Peak Electricity Demand in Summer" and strict control of power generation plan, we effectively utilized the inflow during the flood season through scientific dispatch and ensured an uninterrupted power generation of units, achieving no surplus water for the first time since the operation.



# 05

## Ecological Protection

We actively implement national guidelines for ecological protection, keep to the coordination between ecological protection and economic development, and carry out ecological protection and restoration measures via making innovation in technological means, to advance the formation of a harmonious landscape between mankind and nature.

Species Protection	54
Ecological Restoration	56



## Species Protection

The Three Gorges Area is an important treasure house of natural species in China and the world at large. By taking species protection as our unshakable duty, we are working on the breakthroughs in core technologies for key species protection and the building of a full cycle of species protection system. Meanwhile, we make innovations in the efforts to pursue the integrated ecological operation with marked achievements made in propagation and releasing. Moreover, we continue to ensure that the ex-situ conservation of rare plants is carried out smoothly, and promote the application of the research findings of rare and endangered endemic plants of the Yangtze River, to help the species with natural propagation for the purpose of ecological restoration and take concrete actions to protect biodiversity.

Chinese Sturgeon Propagation and Releasing on

**61** occasions

*"From ecological operation to ecological restoration program of fish habitats of the Heishui River jointly advanced by TNC and CTG, and from the protection and study of Chinese sturgeon to urban water environment comprehensive management of the middle and lower reaches of the Yangtze River under planning, the important part CTG played is obvious in the efforts of ecological protection and protection of the Yangtze River. We have long been a practitioner of environmental protection concept, and thus the responsibilities borne by CTG are a manifestation of China's resolve to advance the joint protection of the Yangtze River."*

—By Wang Luhong, Director of TNC Healthy Rivers Project

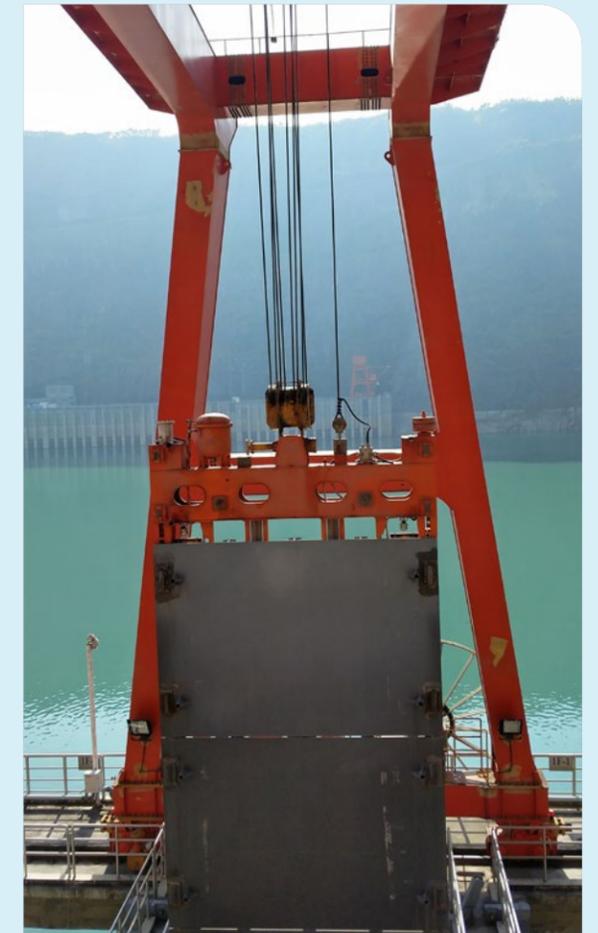


Chinese Sturgeon Releasing Event in Yichang by Chinese Sturgeon Research Institute



### A new record of Chinese sturgeon released migrating to the sea

On April 13, 2019, in Yichang city, Hubei province, we launched the event of Chinese sturgeon releasing, with a total of 700 large second filial generation of Chinese sturgeon released. Meanwhile, sonar is used to track some of the Chinese sturgeon, and up to 73.3 percent of the Chinese sturgeon released migrated to the sea, a record high since scientific monitoring. This event was endorsed and acclaimed by many international organizations such as UNDP China, UNEP China, Electricite de France (EDF), The Nature Conservancy (TNC), the World Wildlife Fund (WWF) and General Electric (GE).



### Ecological operation with stratified intake at Xiluodu HPP

From January to May 2019, under the sound guidance of the Ministry of Water Resources and the Changjiang Water Resources Commission (CWRC), and under the great support of the State Grid and China Southern Power Grid, CYPC succeeded in for the first time the experiment with stratified intake through Xiluodu's two-layer stoplog, thus increasing the water temperature leaving Xiluodu Reservoir. Consequently, this event provided favorable conditions for the propagation of the fishes with demersal & adhesive eggs, and offered the experience for stratified intake through the stoplogs at large-and-medium sized reservoirs in China.

## Ecological Restoration

We are committed to ecological protection of the Yangtze River Basin. For this reason, we strengthen soil conservation during construction activities, speed up soil erosion control in key areas and improve the overall soil conservation monitoring capacity. Moreover, we vigorously advance IT application in soil conservation and strengthen ecological protection, to set an example of soil conservation in the hydropower industry.



Landscaping at the Construction Area of Baihetan HPP

### Marked outcome in soil conservation at Baihetan Project

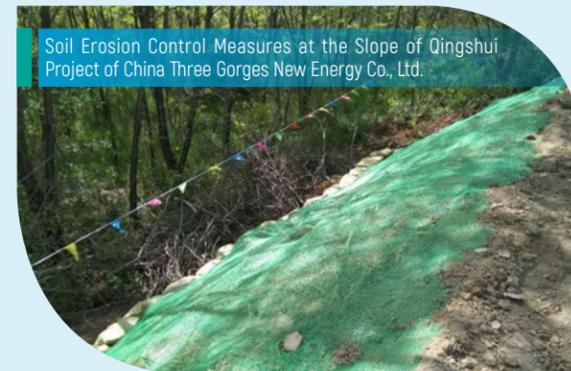
In Baihetan Project, various efforts of soil conservation are carried out with high quality. In the construction area, gabions are put at the toe of Haizigou topsoil stockyard and the toe of Dazhaigou topsoil stockyard. Within the construction area, vegetation restoration is carried out at all slopes. As of the end of 2019, the area of ecological restoration was up to 3.22 km<sup>2</sup>.

### Xiluodu and Xiangjiaba HPPs are listed in the Ecological Protection Programs of National Soil Conservation.

At Xiluodu and Xiangjiaba HPPs, we focus on the goal of "green hydropower project" and "beautiful dam area", follow the principle of "ensuring coordinated progress between development and protection" and fully advance soil conservation, thus yielding fruitful outcome in both construction activities and soil conservation, and marked outcome in soil erosion control. In 2019, both Xiluodu and Xiangjiaba HPPs were listed in the Ecological Protection Programs of National Soil Conservation in the 2019 Production and Construction Projects of the Ministry of Water Resources.



Soil Conservation by Backfilling of Dachaidan Project of China Three Gorges New Energy Co., Ltd.



Soil Erosion Control Measures at the Slope of Qingshui Project of China Three Gorges New Energy Co., Ltd.



Road Rehabilitation of Zhangjiachuan Project of China Three Gorges New Energy Co., Ltd.



Soil Conservation of Xintai Photovoltaic Power Station of China Three Gorges New Energy Co., Ltd.



# 06

## Popularization of Environmental Protection Concepts

Through integrating the philosophy of ecological protection and our core values, we actively promote the concept of environmental protection, spread the knowledge of environmental protection and share our experience in ecological protection, environmental protection and low-carbon lifestyle, to make the public fully aware of sustainable development.

Knowledge Building Program	60
Public Benefit of Environmental Protection	63



## Knowledge Building Program

We summarize the experience gained from environmental protection, strengthen awareness in and outside CTG, and spread the concept and knowledge of environmental protection.

### Environmental Protection Training

Through various training and education programs on environmental protection, we raise the sense of responsibility of all our staff about actively participating in ecological protection, and constantly enhance the capacity of environmental protection, to improve the overall level of environmental management.



Environmental Protection Training of China Three Gorges New Energy Co., Ltd.



Environmental Protection Training of Uganda Isimba Hydro Power Plant

## Awareness Promotion Program

Through science-based awareness promotion programs, we spread the knowledge of hydropower and new energy, and promote the concept of environmental protection and the technological results of environmental protection.



### Improving the public aware of environmental protection through science-based awareness promotion programs

By leveraging the Rare and Endemic Plant Scientific Research Demonstration Area at the 185 Platform, the Yangtze River Rare Plant Research Institute advances its publicity efforts by using such demonstration area as the publicity base of the joint protection of the Yangtze River. On top of that, the Yangtze River Rare Plant Research Institute has carried out over 100 awareness promotion activities of plant protection, and offers the information about plant protection on CTG's official website and the China Three Gorges Project News.



### Low-carbon Life

Low-carbon lifestyle bears on human development. On the World Earth Day and the Low Carbon Day, we usually organize various activities to advocate low-carbon lifestyle and build a new trend in green development.



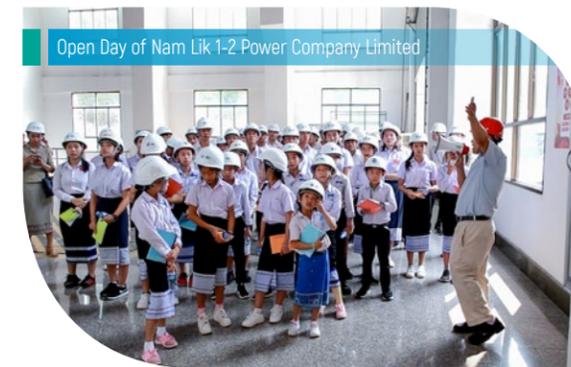
Activities of TGBD on the World Environment Day

#### Advocating green lifestyle

To ensure the efforts for publicizing energy conservation and emission reduction, our employees and clients pursue the low-carbon lifestyle. Each subsidiary and department under CTG carries out publicity activities on the World Environment Day (June 5), such as putting up posters and signs of environmental protection, hanging banners, posters and setting up LED display screens, to publicize the concept of environmental protection and raise the awareness of potential risks and the awareness of energy conservation of the public.

## Public Benefit of Environmental Protection

Taking the public activities of environmental protection as an opportunity, we spread the concept of environmental protection and the results of green technologies to all walks of life, carry out the promotion of environmental protection on the sites of overseas projects, advocate waste recycling, and work together with the stakeholders to build a beautiful home.



Open Day of Nam Lik 1-2 Power Company Limited



Activities of the Community of Ecuador Santa Elena Hydropower Project on the World Water Day

#### Light the city of wetland to raise public awareness of biodiversity conservation

On March 30, 2019, CTG, together with WWF and Wuhan Gardening and Forestry Bureau, organized a large environmental protection event - Light the City of Wetland to Build an International Wetland City & Earth Hour (Wuhan 2019). This event, taking Earth Hour as an opportunity, shared CTG's story of protecting Chinese sturgeon and rare plants, representing our concrete actions to inspire the sense of responsibility of protecting Nature and the Earth.

# 07

## Environmental Protection Performance

By centering on the primary task of "Green Development, Key Breakthroughs, Sound System and Standardized Management", we, with solidarity and synergy, implement the principle of green development to achieve environmental protection in many aspects via systematical actions.

Environmental Monitoring	66
Status of the Aquatic Ecosystem	66
Environmental Protection Performance	67



## Environmental Monitoring

### Mainstream Water Quality and Environment in the Three Gorges Reservoir Area

In 2019, along the Three Gorges reservoir area, the proportion of the mainstream with Grade I-III water quality is 98 percent, the same as that in 2018 (98 percent); and the proportion of the tributaries with Grade I-III water quality is 96 percent, marginally better than that in 2018 (95 percent).

Chart of Nutrition Distribution in 12 Tributaries Monitored in the Three Gorges Reservoir Area in 2019

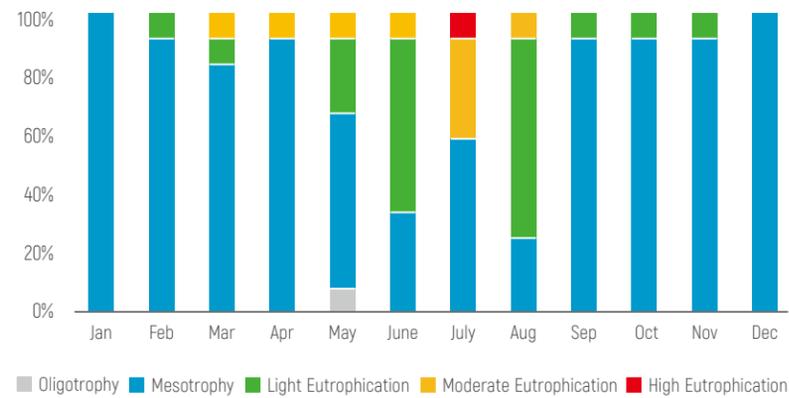
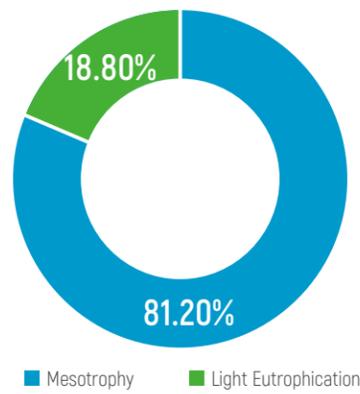


Chart of Annual Assessment of Eutrophy Level in the Tributaries of the Jinsha River Reservoir Area in 2019



## Status of the Aquatic Ecosystem

### Rare and Endemic Fish

In 2019, two types of rare fishes from the upper reach of the Yangtze River, namely, *Myxocyprinus asiaticus* and *Acipenser dabryanus*, were found in the lower reach of the Jinsha River. 23 endemic fish species were detected in the upstream of the Yangtze River, with a total of 2,224 fish. Designated species from the upstream of the Yangtze River were detected in 15 of the 16 river segments under monitoring, with only Longchuan River Estuaries making no detections. The biggest number of endemic fish species was found in the Luzhou River Estuary, with 13 species, followed by the Jiangjin River Estuaries, with 9 species, and the lowest number in the Fotancun and Shuifu River Estuaries, with only 1 species.

### Important Commercial Fish

In 2019, 106 species of fish were detected in the lower reaches of the Jinsha River basin. The main catches in the whole section were *Silurus meridionalis* (Chinese large-mouth catfish), *Coreius guichenoti*, *Hemiculter tchangii*, *Spinibarbus sinensis*, carp, *Liobagrus marginatus*, *Leiocassis longirostris*, *Schizothorax prenanti*, *Pelteobagrus nitidus* (shining catfish) and *Rhinogobio ventralis*.

### Water Temperature

From mid-late January to early May 2019, the average discharge temperature of Xiluodu Reservoir increased by about 0.2-0.4 °C during the implementation of the ecological operation experiment with stratified intake.

## Environmental Protection Performance

### Benefit of Flood Control

Total amount of impounded flood water (10<sup>8</sup> cubic meters)



\*From the statistical data of the Three Gorges Reservoir

Amount of water supplied to the middle and lower reaches of the Yangtze River during the dry season (10<sup>8</sup> cubic meters)

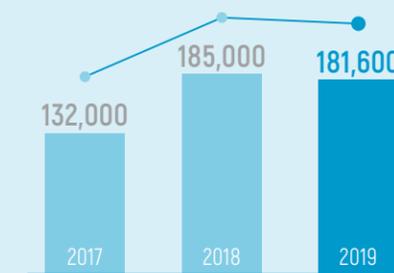


### Reproduction and Release

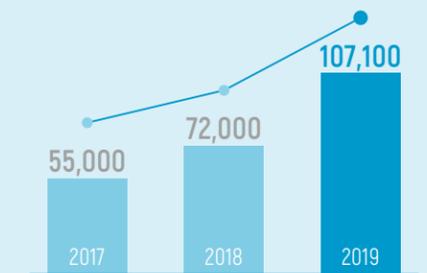
In 2019, quantity of rare and endemic fish released at CTG's release station:

**288,700** fish

The number of rare and endemic fish species released at the propagation and releasing stations of Xiluodu and Xiangjiaba HPPs



The number of rare and endemic fish species released at the propagation and releasing stations of Baihetan and Wudongde HPPs



### Soil and Water Conservation

In 2019, within the construction area of Baihetan HPP, the proportion of the total soil conservation is 89.25 percent, control ratio of soil erosion 0.57, vegetation restoration proportion 84.61 percent, vegetation coverage 23.36 percent, slag retention ratio 97.55 percent and topsoil protection rate 97.18 percent. As a result, soil conservation performance satisfies the requirements in the construction period.

## Outlook for 2020

The year 2020 is crucial for CTG to earnestly fulfill the task mandated by our country to play a pivotal role in the joint protection of the Yangtze River. Under the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, we will continue the efforts of giving priority to ecosystem and green development, follow through our two-pronged strategy where clean energy development and environmental protection of the Yangtze River go hand in hand, and set an example of high-quality development of the Yangtze River Economic Belt by focusing on the overall water environment treatment, to devote ourselves to building CTG into a first-class enterprise of environmental protection.

Great progress and initial results have been made in the joint protection of the Yangtze River. Nevertheless, we will continue to fulfill the new mission mandated by the country and regard the joint protection of the Yangtze River as the primary task at the present

stage and in the long run. Meanwhile, we will respond squarely to more difficulties and strive for a new page for the joint protection of the Yangtze River, to make new contributions to achieving high-quality development of the Yangtze River Economic Belt. On top of that, we will work hard to advance the efficient and coordinated operation of the five major platforms (financing platform, R&D platform, core implementation platform, joint development platform and supporting platform), arrange for our business in the provinces and cities along the Yangtze River and roll out urban sewage treatment in 11 provinces and cities along the Yangtze River Economic Belt as well as overall water environment treatment, to phase in the initiative of "Water Pollution Treatment, Water Ecosystem Restoration and Water Resources Protection".

We have long been focusing on the improvement in overall benefits of cascade hydro-complexes and taking a coordinated approach for flood control, navigation, power generation and ecological protection. Meanwhile, we actively explore new ways to carry out ecological operation and enhance the role of cascade hydro-complexes in providing service for the ecosystem, to maximize the overall benefits of the basin.

We are devoted to the strategy of "becoming a pacesetter in offshore wind power" and the development of wind power and solar power, etc. We will continue to upgrade the structure of onshore new energy and enhance lean operation and management, to constantly improve the benefits brought by and the efficiency of project development. Furthermore, we will actively advance the large-scale development of offshore wind power along the coastal cities to inject impetus into ecological protection and green development of the Yangtze River Economic Belt.



## Expert Comments

The year 2019 marked CTG's 15<sup>th</sup> Annual Report on Environmental Protection, a report released for 15 consecutive years. This report demonstrates in detail the unremitting efforts of and great contributions by CTG in the process of green development and clean energy development of the Yangtze River Economic Belt. It is well-organized, with clear structure and focuses, absolutely an excellent report on environmental protection. This report reflects the following features.

**A symbol of readiness to shoulder responsibility and accountability.** The year 2019 was crucial for CTG to play its part in achieving great progress in the joint protection of the Yangtze River. This report, in the form of feature topics, demonstrates CTG's philosophy, actions and updates of pursuing high-quality development in the joint protection of the Yangtze River, displaying CTG's readiness to shoulder responsibility and accountability as a key player in the joint protection of the Yangtze River.

**Diverse practice cases.** This report, with a number of real cases and reliable data, demonstrates the distinctive practices and outcomes of CTG in ecological protection of the Yangtze River, clean energy development, innovation in environmental protection technology, low-carbon development as well as conservation and recycling, presenting a shining image of CTG to fulfill the responsibility in green development and sustainable development. These cases in this report cover CTG's business scope at home and abroad, and involve more business types and more subsidiaries, symbolizing environmental protection concepts such as whole river basin and whole life cycle. And the data is a mirror of CTG's input and steady progress in environmental protection in 2019.

**Deepening of green development philosophy.** This report centers on Chinese President Xi Jinping's thinking on ecological protection and new trend of green development since the 19<sup>th</sup> National Congress of the Communist Party of China. Through firmly bearing in mind the industry features and characteristics of CTG, this report blends the philosophies of ecological protection and sustainable development into its context, outlines CTG's efforts of strengthening environmental protection management, making innovations in environmental protection technologies, enhancing environmental protection capacity and increasing the publicity of environmental protection, really impressing the readers.

CTG is expected to serve as a pacesetter and guardian as before in ecological protection, maintain steady progress in building itself into a world-class clean energy provider, and work together with the stakeholders to contribute more to the sustainable development in China and the world as a whole.

### Qian Xiaojun

Professor at the School of Economics and Management, Tsinghua University  
Associate Dean of Schwarzman College, Tsinghua University

Director of the Research Center for Green Economy and Sustainable Development, Tsinghua University

*The Annual Report on Environmental Protection 2019 of China Three Gorges Corporation* is a professional report with high quality. This report, informative, logic, specific and illustrative, shows the management measures, practices and outcomes of CTG in environmental protection of 2019 and demonstrates CTG's two-pronged strategy where clean energy development and environmental protection of the Yangtze River go hand in hand.

**Tallying with national strategies.** This report shows that CTG's efforts tally with national strategies and actions. With its full strength advancing the joint protection of the Yangtze River, CTG expands into new business areas, fosters new growth drivers and achieves new development while improving the ecology of the Yangtze River. On top of that, CTG achieved full operation of the five major platforms, all-round progress in project development and the joint protection of the Yangtze River, setting an example of high-quality development of the Yangtze River Economic Belt.

**Consolidating the foundation of environmental management.** From the institutional framework, management system, process management, technological innovation as well as exchanges and cooperation, this report displays an environmental management pattern of CTG featuring the coverage of the whole basin, whole life cycle, openness and information sharing, scientific and technological innovation. And this report, with diverse measures and outcomes, demonstrates that CTG's environmental management is systematical, comprehensive and advanced, a manifestation of CTG's responsibilities of achieving the goal of the Paris Agreement and building a more sustainable living environment.

**Solid progress in green development.** This report, starting from green product, clean and low-carbon pattern, conservation and recycling, awareness promotion, environmental protection monitoring and other core subjects of environmental protection, employs adequate data and reliable cases to give a full view of CTG's outcomes in advancing green development, and fully embodies CTG's philosophy of actively advancing the concept of ecological protection and green development.

On top of that, this report is carefully edited, with appropriate graphic design, wording and color, a very readable report with extensive academic knowledge.

CTG is expected to play a leading role in green development of China in the future, make new breakthroughs in the joint protection of the Yangtze River and raise its engagement in environmental protection to a new level.

### Xue Dayuan

Professor at the College of Life and Environmental Sciences,  
Minzu University of China

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<b>Company overview</b>				
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2.4	Management philosophy and culture		✓	P8-P9
2.5	Management framework and related policies		✓	P28-P29
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2.12	Consultation and information feedback method	✓		P78
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## Readers' Feedback

In order to improve CTG's environmental protection work and enhance the corporation's ability for and level of green development, your comments and suggestions would be greatly appreciated. Please spare the time to give us your valuable opinions on our work and report. Thank you!

1. How would you evaluate the Annual Report on Environmental Protection of CTG in general?

Great  Good  Average

2. How well do you think CTG has been doing in proactively serving government and customers?

Great  Good  Average  Bad  I don't know

3. How well do you think CTG has been doing in protecting the environment and promoting sustainable development?

Great  Good  Average  Bad  I don't know

4. How well do you think CTG has been doing in communicating with stakeholders?

Great  Good  Average  Bad  I don't know

5. Do you think that the Report is able to reflect the major environmental influences CTG has had?

Yes  Maybe  No

6. What do you think of the clarity, accuracy and completeness of the data and indices disclosed by the Report?

Very High  High  Average  Low  Very Low

7. How the layout of the Report help your reading?

Greatly  Okay  Badly

8. You are welcome to give your opinions and suggestions about environmental protection work of CTG and the Report here:

Note: Please tick ["√"] the corresponding circles ["○"] and mail this page to the following address:

Department of Environmental Protection, CTG

No. 1, Yuyuantan South Rd., Haidian District, Beijing, China. Zip code: 100038

For online opinions, please send them to wang\_pengyuan@ctg.com.cn, or you can leave you valuable opinions on the official website of CTG at <http://www.ctg.com.cn/hjnbdc/index.php>.



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