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LAND, INFRASTRUCTURE, HOUSING AND PUBLIC UTILITIES



Land, Infrastructure, Housing and Public Utilities

Lands, Public Works and Transport Bureau

The Lands, Public Works and Transport Bureau (DSSOPT) is a public administrative authority that provides support to other branches of government in matters of land utilisation and management, urban planning, infrastructure, and basic services.

Macao Urban Planning

Master Plan

The DSSOPT completed the draft of Macao's Urban Master Plan (2020-2040) in August 2020, and launched a 60-day promotion, display and public consultation from September to November in 2020, to collect opinions and suggestions from different sectors of the community. The opinions and suggestions collected during the consultation period were subsequently sorted, categorised, and analysed.

New Urban Zone Planning

In 2020, the New Urban Zone Area A planning refinement and design direction study was launched, with a view to optimising the land zoning, roads and open spaces in the area, stipulating urban city design directions, and making suggestions regarding execution and regulation. The study report was completed and approved in 2020, and would serve as a reference for future development.

The New Urban Zone Area B East Wing planning modification and design direction study was also launched, with a view to planning the land use, transportation network and public infrastructure layout in the area, determining directions for urban city design and the actual development of various land zones in the next phase.

The DSSOPT continued to deepen the planning of New Urban Zone Area E and, based on the study results, gradually implemented the land zone positioning and layout of various road networks, public facilities and infrastructure, granulated land function, and pressed forward with compiling the draft New Urban Zone Area E planning conditions.

Project Plans

As regards the revision of the overall planning of Macao border checkpoints and their neighbouring regions, the research unit finished compiling the final study report, providing overall recommendations as well as execution plans regarding land use, transportation planning, public facilities and infrastructure planning, and public open space.

Regarding the planning of the Coloane Lai Chi Vun and Rua dos Navegantes Promenade, the results of immobile heritage assessments by the cultural authorities were merged into the Report on the Overall Plan for Flood Prevention and Drainage on the west side of Coloane, providing suitable refinements and suggestions for modifications of the land layout and urban planning of

two zones – the Lai Chi Vun Shipyards and the west of Rua dos Navegantes. A revised report on study results was submitted by the research unit.

Regarding the study on optimising the Taipa-Coloane Causeway (Cotai Strip), the final study report submitted by the research unit by the end of 2020 was approved. The report mainly focused on the overall planning of road service levels, commuter flows within the area, crossing facilities, pedestrian spaces and scenic design of the Cotai Strip, and advised on the plan for optimising the Taipa-Coloane Causeway region.

Planning Condition Drafts

Urban planning conditions for districts lacking detailed planning are being compiled by the DSSOPT in accordance with the Urban Planning Law and the Rules for the Implementation of the Urban Planning Law. During 2020, 144 sets of planning conditions for urbanisation management were issued.

To alleviate the impact of the COVID-19 pandemic on the construction industry, the Government launched a street beautification (facade renovation) project in the first half of 2020, with a view to boosting employment. This focused on renovating building facades. The DSSOPT mainly assumed responsibility for Coloane old urban district, and launched the Ho Yin Garden pedestrian expansion and Taipa Avenida Padre Tomas Pereira pedestrian optimisation projects in the second half of the year.

Construction Companies and Contractors

According to DSSOPT statistics, as at the end of 2020, a total of 1,442 companies (urban construction), companies or individual business owners (urban construction and urban planning), companies (gas) and construction contractors (urban construction) were legally registered or had their registration renewed, with details as follows:

Category		New registration	Renewed registration	Total
Companies (urban construction)	Construction	100	925	1,025
	Fire	5	77	82
	Sub-total	105	1,002	1,107
Companies or individual business owners (urban construction and urban planning)	Plan drafting Construction supervision Construction monitoring	17	90	107
	Fire	0	10	10
	Sub-total	17	100	117

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Category		New registration	Renewed registration	Total
Companies (gas)		0	36	36
Construction contractors (urban construction)		12	170	182
Total		134	1,308	1,442

Technicians

Technicians, including engineers and architects, are categorised according to their professions in the above-mentioned law. By the end of 2020, the number of valid registrations for ten types of technicians and engineers totalled 990 person-times, with six people who each held two professional titles. Details are as follows:

Category		New registration	Renewed registration	Total
Technicians (construction and urban planning)	Architects	2	194	196
	Landscape Architects	0	1	1
	Civil Engineers	7	454	461
	Fire Engineers	0	5	5
	Electrical Engineers	4	77	81
	Electrical and Mechanical Engineers	0	144	144
	Mechanical Engineers	1	87	88
	Chemical Engineers	0	5	5
	Industrial Engineers	0	0	0
	Fuel Engineers	0	1	1
	Engineering Technicians	0	8	8
Total		14	976	990

Infrastructure Projects

Private Construction Projects

According to statistics from the Lands, Public Works and Transport Bureau, in 2020, 30 building projects providing 2,365 residential flats with a total floor area of 179,523 square metres, 105

commercial units with a total floor area of 16,242 square metres, and 1,729 parking spaces (1,328 for private cars and 401 for motorcycles) in car parks, with a total area of 54,166 square metres, were completed. No office or industrial/warehouse unit was completed during the year.

During 2020, construction commenced on 22 private projects providing 812 units with a total floor area of 47,527 square metres, 49 commercial units with a total floor area of 15,060 square metres, and 501 parking spaces (399 for private cars and 102 for motorcycles) in car parks, with a total area of 15,060 square metres. No office unit or industrial/warehouse project commenced during the year.

By the end of 2020, 4,314 units were under construction, of which 4,058 were residential units with a total floor area of 306,673 square metres, 238 were commercial units with a total floor area of 31,429 square metres, 16 were office units with a total floor area of 5,501 square metres; as well as 2,647 parking spaces (1,993 for private cars and 654 for motorcycles) in car parks, with a total area of 82,739 square metres.

During the year, a total of 9,563 units were still in the design phase, of which 8,705 were residential units with a total floor area of 661,354 square metres, 832 were commercial units with a total floor area of 184,623 square metres, 22 were office units with a total floor area of 8,419 square metres, and four were industrial warehouses with a total floor area of 30,138 square metres; as well as 8,519 parking spaces (6,084 for private cars and 2,435 for motorcycles) in car parks, with a total area of 265,238 square metres.

In 2020, 9,331 applications were received for private construction projects, of which 2,225 were for simple projects in common parts of buildings, food and beverage establishment integrated construction projects, and construction licences, 2,160 were for demolition/maintenance/renovation, and 617 were for construction/expansion. During the year, 9,745 applications from 2020 and the previous year were handled, a majority of which were in the above-mentioned three major categories: 2,409 applications for demolition/maintenance/renovation projects, 2,203 applications for simple projects in common parts of buildings/integrated construction projects for food and beverage establishments/construction licences, and 756 applications for construction/expansion projects.

Construction Document Certification

In 2020, the DSSOPT's general archive unit handled 5,427 applications for review of construction plans (i.e., certification of construction documents with approved licences).

Public Construction and Infrastructure Projects

To enhance the quality of various community facilities and government services, the Lands, Public Works and Transport Bureau followed up on a number of public works projects in 2020, with 73 projects commenced and 76 projects completed during the year. Among them, 61 projects cost below 2.5 million patacas, and 12 projects cost over 2.5 million patacas.

Projects completed in 2020 included: many follow-up projects that commenced the previous year and continued into 2020; a relatively large project that involved phase 2 of the community

services complex at Rua da Praia do Manduco, and commenced in 2017; renovation of 105 Avenida do Conselheiro Ferreira de Almeida, which commenced in 2018; and the construction of the Public Prosecutions Office (Phase 2), which commenced in 2019.

In 2020, a total of 15 services were launched, two of which involved compilation of project plans, including for the renovation of Qingmao Checkpoint joint inspection building, and repair of the infrastructure of the Outer Harbour Ferry Terminal. Two public tenders were issued, involving cross-harbour bridge services.

On the infrastructure front, the Government continued following up regarding the plan for flood prevention and drainage in the Macao peninsula and the Islands District, road network implementation, sewer improvements, cross-harbour bridges and slope monitoring and maintenance.

In 2020, four studies were completed, two studies commenced, four design projects were completed, four design projects commenced, 21 construction projects were completed, and 31 constructions projects commenced. Two of these projects were relatively large-scale and involved public tenders.

To eliminate flood and drainage problems of Macao in the long-term, the Lands, Public Works and Transport Bureau finished drafting the plan for the project to construct a Flood Storage Pond for Rainwater and Improvement of Drainage System at the Inner Harbour, and completed the feasibility study on building a storage pond and a sewage pump station at the original site of Macao (Yat Yuen) Canidrome Club. The DSSOPT issued a report on Real Time Digital Modelling for Effectiveness Certification of the Sluices in the Inner Harbour, providing analyses of simulations and scientific arguments on the effectiveness of the sluices.

Other smaller districts also started flood prevention and drainage projects, including the completion of Overall Plan for Flood Prevention and Drainage at the Outer Harbour, and the launch of Feasibility Study on Flood Prevention and Drainage at West Coloane. Meanwhile, the Flood Prevention Work along the Coast from Fai Chi Kei to Ilha Verde has already commenced.

The infrastructure work involving sewers, road transport networks, cross-harbour bridges and slopes mainly comprises:

1. Studies, including:

- Nobre de Carvalho Bridge – Preliminary Design, Engineering Investigations and Study on the Construction of Two Cross-harbour Tunnels; and
- Seac Pai Van Reservoir expansion works – study on reservoir deepening and soil probe.

2. Project plans, including:

- Construction of a cross-harbour tunnel in New Urban Zone Area A and Area B – preliminary design;
- Construction of a bridge connecting New Urban Reclamation Zone A and Macao Peninsula (A2);
- Lift construction at the flyover on Avenida do Dr. Rodrigo Rodrigues;

- New Urban Zone Area E1 Eastroad and drainage network construction – compilation of project plan;
- Avenida Dr. Sun Yat-Sen tunnel exit project – preliminary design; and
- Road construction near Avenida da Harmonia – compilation of project plan.

3. Monitoring projects, including:

- Monitoring Structural Safety of Sai Van Bridge and Friendship Bridge;
- Newly added monitoring of the structural integrity of Nobre de Carvalho Bridge; and
- On the slope front, slope data collection continued through the automatic monitoring system at Taipa Grande and Mount Fortress slope.

4. Construction works, including:

- Continued works on new roads near Avenida Marginal Flor de Lotus, Taipa;
- Construction of the Skywalk at Avenida de Guimaraes on Taipa;
- Maintenance of girders and bolstering the base of Friendship Bridge;
- New coastline flood prevention project from Fai Chi Kei to Ilha Verde;
- New project involving design and construction of a pedestrian system around Guia Hill; and
- New project on improved pedestrian flows along Taipa Avenida Padre Tomas Pereira.

Infrastructure project	Number of projects commenced	Number of projects completed
Study	2	4
Design	4	4
Construction	31	21

Infrastructure Development Office

Established in 2000, the Infrastructure Development Office is responsible for fostering and coordinating the execution, maintenance, modernisation and development of major constructions projects implemented in the Macao SAR, as well as research, follow-up work and implementation of cooperative construction projects within the Greater Pearl River Delta region.

In October 2019, the Infrastructure Development Office took over projects that were originally handled by the former Transportation Infrastructure Office, and continued pushing forward with the development of the Light Rail Transit (LRT) System.

Hospitals

Islands District Medical Complex

The Islands District Medical Complex is adjacent to the Taipa-Coloane Causeway, with a total land lot area of 75,800 square metres. The construction involves seven buildings, in addition to roads, public squares, vehicle flyovers, footbridges and related infrastructure facilities within the area, with a total floor area of 420,000 square metres.

First-phase construction includes: a nursing academy, staff dormitory building, a hospital complex, an auxiliary building, a general service administrative building and a central laboratory building. Construction of the nursing academy has been completed, while the work on the other construction projects is underway.

Road Infrastructure

Coloane-Ka Ho Tunnel

The Coloane-Ka Ho Tunnel project is being constructed in three parts: the tunnel section, south exterior section, and north linkage section. The project will connect Ka Ho and the east of Cotai, for convenient movements of residents and vehicles to and from the port, without having to make a detour via Estrada da Barragem de Ka Ho, Estrada de Nossa Senhora de Ka Ho, Estrada do Altinho de Ka Ho, or Taipa-Coloane Causeway. It can also reduce commuting times and ease the long-term traffic burden. At present, the construction of the tunnel section and south exterior section has been completed, with work progressing on the north linkage section.

The Fourth Macao-Taipa Cross-Harbour Bridge

The fourth Macao-Taipa cross-harbour bridge starts from the east wing of Macao New Urban Reclamation Zone A, links with the Artificial Island of the Hong Kong-Zhuhai-Macao Bridge, and ends at Macao New Urban Reclamation Zone E1. The 3.1-kilometre-long bridge includes an approximately two-kilometre-long cross-sea section. The bridge is designed to support eight lanes, including two in the middle that will be exclusively for motorcycles. The construction work is underway. The construction of neighbouring road networks at both ends of the bridge commenced in 2020, in tandem with the works at Taipa-side Pac On link and at Avenue Wai Long link.

Public Housing Projects

To meet the people's housing needs, the Infrastructure Development Office has launched a number of public housing projects since 2007, including Taipa Lot TN27, public housing estates in Seac Pai Van, and redevelopment of public housing in Fai Chi Kei, Bairro da Ilha Verde Lot 1, 2 and 3. Construction of public housing that restarted in 2012 and 2013 at Northeast Road on Taipa, Rua de Choi Long, Fai Chi Kei Lots E, F, L4 and L5 has been completed.

Public housing projects that are underway include: second phase of the Mong Ha Public Housing project; Rua Central De Toi San Public Housing Estate; Avenida de Venceslau of Morais Public

Housing project, and B4, B9 and B10 of New Urban Zone Area A public housing phase 1. There was also progress with the design and preliminary work on the public housing project at Avenue Wai Long, Taipa.

To implement the housing scheme for senior citizens proposed in the policy address, construction of around 1,800 studio apartments (T0) and the auxiliary social service facilities commenced at the end of 2020, on a piece of land of 6,828 square metres adjacent to Av. Nordeste in Areia Preta.

New Urban Reclamation

In line with Macao's future development and to increase land supply, in 2006 the Government reported its land reclamation plan to the Central People's Government. The whole land reclamation plan received approval from the Central People's Government in December 2009, and the MSAR Government is expediting the land reclamation works.

The new urban reclamation area comprises five parts, with a total area of 350 hectares, and is expected to provide Macao with a land reserve lasting 20 to 30 years. Reclamation works at Area A and Area E were completed in 2017. Reclamation and dyke works of Area C and Area D are in progress.

Cross-border Cooperation Projects

New Guangdong-Macao Border Crossings

Construction of a new Guangdong-Macao border crossing is one of the Guangdong-Macao cooperation projects. It mainly includes construction of a new border checkpoint (Qingmao Checkpoint), a border crossing channel, and the Canal dos Patos improvement works

The construction of the Qingmao checkpoint buildings on the Macao side and Zhuhai side, together with the crossing, were completed, with interior works and electrical and mechanical system tests underway. There was progress with the Canal dos Patos improvements works.

LRT Project

The LRT Taipa line commenced operations in 2019. Construction of the Taipa line linkages to Macao peninsula, Barra Station, Seac Pai Van line and works of Hengqin Extension is underway.

Macao Civil Engineering Laboratory

The Macao Civil Engineering Laboratory was established in 1988, and is a non-profit public legal body engaged in science and technology, which is autonomous in terms of technology, budget and assets. The chairpersons of the Board of the General Assembly and Board of Directors are both appointed by the Government.

The responsibilities of the Macao Civil Engineering Laboratory are to provide civil engineering and related technical support to the Government and relevant industries.

Housing

Housing Bureau

The Housing Bureau aims to fully implement the Government’s public housing policy; rationally allocate public rental housing resources to underprivileged families in need; provide technical coordination and assistance for strata-title buildings management; issue licences to and regulate enterprise owners engaged in strata-title buildings management in accordance with the law; monitor the real estate agency business; and issue relevant licences in accordance with the law.

Home-Ownership Scheme Housing

In the early years, Home-Ownership Scheme housing units were sold to families on the Housing Bureau’s waiting list on terms and at prices stipulated in the land grant contracts by the bureau in accordance with Decree-Law No. 13/93/M.

Pursuant to Law No. 10/2011 – “The Home-Ownership Scheme Housing Law” re-promulgated by Executive Order No. 200/2020, the construction of Home-Ownership Scheme Housing is led by the Government and executed by the Housing Bureau or other public authorities appointed by the Chief Executive.

Rationale for Home-Ownership Scheme Housing

Home-Ownership Scheme Housing is intended to assist Macao residents of a particular income level and financial situation to meet their housing needs, and to promote a housing supply that suits the practical needs and purchasing power of Macao residents.

Home-Ownership Scheme Housing Allocation

The process of allocating 1,900 multiple-room Home-Ownership Scheme housing units to those who submitted general applications at the end of 2013 is still under progress. As at 31 December 2020, a total of 1,870 family applicants were allocated housing units.

General application for 3,011 housing units began at the end of November 2019. As at 29 October 2020, a sorted list of applicants was randomly generated by computer. Substantial examination of accepted applicants is underway.

Public Housing

Public housing units are distributed in the form of leasing by the Government to families of weak financial standing or with special difficulties. Families of weak financial standing are defined as those whose monthly household incomes and net asset values fall beneath the legally stipulated levels as stipulated by Executive Order. The allocation and leasing of public housing are regulated by Law No. 17/2019 – Legal System for Public Housing and By-law No. 30/2020 – By-law of Rules for the Implementation of the Legal System for Public Housing.

Granting of Public Housing

The Housing Bureau launched a new round of open applications for public housing in November 2017. After a review of the applications, a waiting list was announced in February 2019, covering 6,351 households. As at 31 December 2020, 2,518 households had been allocated housing, and 1,326 households gave up their applications or were delisted.

Public housing was open for ongoing application from 20 August 2020 onwards. As at 31 December 2020, the Housing Bureau received a total of 2,561 applications.

Building Management

The Housing Bureau exercises its supervisory power under Decree-Law No. 41/95/M dated 21 August to manage the common areas of Home-Ownership Scheme housing, and to require relevant parties to fulfil their duties stipulated in the applicable laws and regulations. The Housing Bureau may impose fines on management entities or strata-title building owners who violate their duties as stipulated in the Decree-Law.

The Housing Bureau also facilitates and helps owners of strata-title buildings under the Home-Ownership Scheme with arrangements for setting up management organs and convening the first meetings, and provides technical assistance to owners, management organs and corporate managers of strata-title buildings. In 2020, the bureau handled 4,937 cases of Home-Ownership Scheme management-related affairs, fostered 86 management organs of Home-Ownership Scheme housing that are already in place and operating effectively, and handled 3,812 cases involving convention of owners of strata-title buildings under the Home-Ownership Scheme and affairs regarding the operations of management organs. There were 4,303 cases of assistance provided for the management of private housing common areas.

The Housing Bureau also keeps abreast of all necessary renovation and improvement works for public housing. In addition to public facilities of housing estates, it strives to improve indoor facilities, so as to improve the quality of life of its tenants, particularly for elderly single people.

Strata Title Buildings Management Commercial Operation

In accordance with the Law on the Commercial Management of Strata Title Buildings effective from 22 August 2018, it is mandatory to obtain a valid licence to engage in commercial management of strata-title buildings. As at 31 December 2020, a total of 102 licences and 191 temporary licences for commercial management of strata-title buildings had been issued.

Seven Schemes Under the Property Maintenance Fund

To encourage and help homeowners to perform their duties regarding maintenance of common building areas, in March 2007 the Housing Bureau established the Property Maintenance Fund to assist them with inspecting, testing and repairing, removing illegal structures within and establishing management organs of the common areas of private housing.

As at 31 December 2020, 356 applications for the seven schemes under the Property Maintenance Fund were approved, with subsidies totalling over 35 million patacas. A total of 4,482 applications have been approved since the establishment of the fund, granting subsidies totalling 449 million patacas.

Joint Centre for Building Leakage Issues

Through cross-departmental cooperation among the Lands, Public Works and Transport Bureau, Municipal Affairs Bureau, Health Bureau, Legal Affairs Bureau and Housing Bureau, the Government established the Joint Centre for Building Leakage Issues on 1 February 2009. The centre provides one-stop assistance to owners of flats that are origins of leaks to encourage maintenance. In 2020, 1,788 cases were filed for investigations; and there was follow up work on 2,538 cases*, 1,268 of which were completed**.

* Total number of new and old cases pending processing to date.

** Total number of cases completed in 2020.

Squatter Area Clearance

To comply with Macao's urban planning policies and the reallocation of land use, the Housing Bureau is committed to clearing squatter camps and relocating affected residents. In 2020, 11 squatter dwellings were demolished. By the year-end, 416 squatter dwellings remained, of which 186 were on the Macao peninsula and 230 in the Islands District. Moreover, there were still 15 squatter camps holding a temporary occupation licence of water-affiliated public assets, which were under the management of the Marine and Water Bureau.

Real Estate Agency Business

According to the Real Estate Agency Law, which took effect on 1 July 2013, all real estate agents and brokers are required to obtain a valid licence before engaging in business. The Housing Bureau has also set up a unit to follow up applications for licences for real estate agents and brokers, and be responsible for the relevant monitoring work.

Issuing Relevant Licences

As at 31 December 2020, the numbers of licences issued for real estate agents and brokers totalled 2,336 and 8,895, respectively.

Supervision

To facilitate the implementation of laws and various tasks, during 2020 about 1,744 inspections were conducted in business premises of real estate agents, and about 93 inspections were conducted at strata-title buildings, to check the compliance with the Real Estate Agency Law and Strata-title Buildings Management Commercial Operation Law among real estate agencies and strata-

title building management companies, and to initiate disciplinary proceedings against alleged administrative irregularities. Complaints about real estate agents, brokers and strata-title building management company owners were received and handled in accordance with the relevant laws. During 2020, 52 cases involving real estate agents, six cases involving real estate brokers, and 31 cases involving strata-title building management company owners resulted in penalties for breaking the law.

Land Management

Lands Committee

The Lands Committee is a consultative body whose work is supervised by the Secretary for Transport and Public Works. The committee is responsible for advising on land use by recipients of land grants, in terms of legal and contractual obligations. It also advises on fines or other penalties for land grant recipients who fail to comply with the laws and terms of their contracts; cases concerning the public use of granted land; and granting, renewing, renouncing or cancelling temporary land-occupation licenses.

Land Concessions

According to the DSSOPT's statistics, 11 land grant contracts were completed and four orders of land return were issued in 2020. These contracts were as follows:

1. Leases and grants: A total of seven contracts, with newly granted area of 502 square metres and returned area of 2,263 square metres, involving a total floor area of 11,918 square metres;
2. Long-term leases: There were three contracts in total, two of which were long-term leasing concession contracts, and one involved the setting up of public servitude, involving a total floor area of 3,992 square metres;
3. Gratuitous concessions: One contract, which is a new land concession involving a total floor area of 1,104 square metres; and
4. Returned land: Four contracts in total, all being annulled contracts involving a total floor area of 34,503 square metres.

There was no special-purpose concession handled during the year.

The land granted in 2020 was mainly for residential, commercial, car parking, social facility and other development uses. The premiums under land grant contracts during the year totalled 983,517,857 patacas. Actual income received from land premiums during the year totalled 82,263,636 patacas, with 3,654,435 patacas being overdue payments.

The Council of Architecture, Engineering and Urbanism

The Council of Architecture, Engineering and Urbanism (CAEU) has been established according to Law No.1/2015 – “Qualification System for Urban Construction and Town Planning”, in order

to accredit and register holders of professional degrees in 13 subjects: architecture, landscape architecture, urban planning, civil engineering, fire engineering, environmental engineering, electrical engineering, electrical and mechanical engineering, mechanical engineering, chemical engineering, industrial engineering, fuel engineering and transport engineering.

According to information from the Lands, Public Works and Transport Bureau, the transition period prescribed in Law No.1/2015 has already finished. Now application for accreditation and registration is only open to those who have completed field training and passed qualifying examinations.

During 2020, 56 people were approved for professional registration after second review; they were from architecture, civil engineering, mechanical engineering, and electrical and mechanical engineering disciplines. In total, since the enforcement of the law till the end of 2020, accredited professionals in the 13 disciplines totalled 2,601, with the breakdown as follows:

Professions	Numbers of registered professionals (2020)	Numbers of registered professionals (2015-2020)
Civil Engineering	38	1,054
Architecture	7	414
Electrical and Mechanical Engineering	7	315
Electrical Engineering	4	313
Mechanical Engineering	0	275
Environmental Engineering	0	91
Urban Planning	0	58
Chemical Engineering	0	22
Traffic Engineering	0	19
Fire Engineering	0	18
Landscape architecture	0	17
Industrial Engineering	0	3
Fuel Engineering	0	2
Total	56	2,601

In 2020, a total of 140 practitioners of various professional disciplines received council approval to join internships. At the end of 2020, the number of practitioners since the law came into effect was over 552, with details as follows:

Professional Discipline	Number of Interns (2020)	Number of Interns (2015-2020)
Civil Engineering	69	310
Architecture	17	85
Electrical and Mechanical Engineering	21	77
Electrical Engineering	10	37
Mechanical Engineering	17	28
Environmental Engineering	3	8
Urban Planning	2	3
Fire Engineering	1	2
Landscape architecture	0	2
Total	140	552

In 2020, a total of 73 practitioners of various professional disciplines received council approval to register themselves as internship instructors. At the end of 2020, the number of instructors since the law came into effect was 542, with details as follows:

Professional Discipline	Number of internship instructors (2020)	Number of internship instructors (2015-2020)
Civil Engineering	21	232
Architecture	5	102
Electrical and Mechanical Engineering	211	91
Electrical Engineering	10	48
Mechanical Engineering	11	44
Environmental Engineering	1	9
Urban Planning	1	6
Fire Engineering	2	6
Chemical Engineering	1	1
Landscape architecture	0	1

(Cont.)

Professional Discipline	Number of internship instructors (2020)	Number of internship instructors (2015-2020)
Fuel Engineering	0	2
Total	73	542

In 2020 a total of 64 practitioners of six professional disciplines were eligible for qualifying examinations. At the end of year, the total number since the law came into effect was 164, with details as follows:

Professional Discipline	Number of practitioners eligible for qualifying examinations (2020)	Number of practitioners eligible for qualifying examinations (2015-2020)
Civil Engineering	39	102
Architecture	7	27
Electrical and Mechanical Engineering	10	20
Electrical Engineering	3	9
Mechanical Engineering	3	4
Total	64	164

In accordance with Law No. 1/2015 – “Qualification System for Urban Construction and Town Planning”, those in the private sector who have completed at least two years of internship in a relevant professional discipline and obtained examination candidateship, and those public administrative workers who hold a professional degree in a relevant discipline, having been engaged with the relevant profession for at least three consecutive years, and have obtained a waiver of internship from the council, are eligible to sit for the qualifying examination of the relevant professional discipline.

The CAEU held the first qualifying examination in 2019, which saw 56 candidates passing the examination and obtaining professional qualifications. The 2020 qualifying examination – a written test – was held in December, and was attended by 92 candidates from six professions: architecture, civil engineering, electrical engineering, electrical and mechanical engineering, mechanical engineering, and environmental engineering. Only those who passed the written test would be eligible for the second-phase professional interview.

Urban Planning Committee

The Urban Planning Committee, established in accordance with Law No. 12/2013 – Urban Planning

Law, serves as the Government's consultation body and is responsible for discussing and providing opinions on compiling, implementing, reviewing and amending urban plans; advising on the scope for issuing urban planning conditions according to the law; initiating discussions and providing suggestions to the Urban Development Strategy Study; by-laws and draft bills related to urban planning; urban planning technical requirements and guidelines; and other matters assigned by the Chief Executive.

In 2020, the Urban Planning Committee followed up on and discussed planning conditions in 149 cases. Moreover, it appointed new committee members in accordance with Executive Order No. 71/2020.

Urban Renewal Committee

The Urban Renewal Committee, established in accordance with By-law No. 5/2016 – “Urban Renewal Committee”, serves as a government advisory body on formulating urban renewal policy, and is responsible for coordinating between urban renewal policy strategies and other sectorial policies; launching policy management measures and urban renewal campaigns; anticipating the effects of implementing urban renewal measures and actions; conducting research and providing solutions and recommendations on urban renewal related by-laws and draft bills and regulations.

In 2020, the Urban Renewal Committee discussed the opinions collected and advice from consultancy companies, and provided feasible suggestions regarding a study report.

Cross-department Committee

The Cross-department Committee was established in accordance with By-law No. 5/2014, to liaise and follow up regarding the compilation, review, revision and assessment of implementation of urban planning.

The Transportation Infrastructure Office was rescinded, and the composition of cross-departmental committees was modified accordingly. Pursuant to Executive Order No. 103/2020, the number of members was reduced from nine to eight, with a tenure of three years. Committee members include the head of Lands, Public Works and Transport bureaus, who take on the role of coordinator, and senior management representatives from the Municipal Affairs Bureau, the Cultural Affairs Bureau, the Transport Bureau, the Infrastructure Development Office, the Environmental Protection Bureau, the Housing Bureau and Macao Government Tourist Office.

In 2020, the government pushed forward with the public consultation on drafting the urban development master plan. In September, the committee launched a series of promotional activities, presentations and a public consultation for the draft master plan, including a number of consultation sessions.

Water Disposal System

Macao's water disposal system includes the independent networks of the Macao peninsula and Taipa and Coloane islands. Details are as follows:

Water Drainage Systems in 2019

Type Area	Public sewer system (metres)				Rainwater drains (units)	Public sewage inspection pit (manhole) system (units)	Public rainwater pipe outlets (units)	Outlet valves (units)	Pumping stations (units)
	Sewage piping	Rainwater piping	Combined piping	Flow interceptors (rainwater and sewage)					
Macao	105,035.43	109,105.84	62,037.15	18,729.28	16,818	11,801	185	26	29
Taipa	28,129.21	60,884.67	432.67	26,609.31	5,174	3,602	77	1	24
Coloane	30,133.85	29,434.14	0	15,742.42	1,696	1,725	65	1	18
Total	163,298.49	199,424.65	62,469.82	61,081.01	23,688	17,128	327	28	71

The Drainage Division of the Municipal Affairs Bureau is responsible for cleaning and dredging the drainage systems of Macao, inspecting and monitoring their operations, making improvements, and registering relevant information.

During 2020, the Drainage Division received 2,405 complaints, five percent more than in 2019. Among them, 1,867 cases were the responsibility of the Drainage Division, and the other 538 involved drainage blockage of private areas or were under the purview of other public departments. Moreover, the Drainage Division commenced 59 prosecutions concerning violation of the General Regulations Governing Public Places, and 254 subpoenas were issued to alleged polluters.

Slopes

To enhance monitoring of various slopes in Macao, the Government set up a slope safety task force in 1995, to help with classifying the risk levels of slopes through regular onsite inspections, and identifying areas for strengthening and maintenance. Regarding private slopes, the DSSOPT liaises with the related property owners, in order to implement measures in accordance with the advice of the slope safety task force.

The slope safety task force mainly comprises engineers from the DSSOPT, the Municipal Affairs Bureau and the Macao Civil Engineering Laboratory. The DSSOPT and Municipal Affairs Bureau are responsible for maintenance of roads and slopes, respectively.

According to the DSSOPT records, there were 248 risky slopes throughout Macao in 2020. During the year, the DSSOPT conducted one slope improvement project, and the Municipal Affairs Bureau followed up on five slope improvement projects.

Number of slopes / risk	High	Medium	Low	Total
Macao peninsula	0	33	81	114
Taipa island	0	25	41	66
Coloane island	0	14	54	68
Total	0	72	176	248

In 2014, the DSSOPT began setting up an automatic slope monitoring system at Taipa Grande. The system effectively provides real-time monitoring of slope data. The real-time data on slope dislocation, subsidence and cracks is sent to the Macao Civil Engineering Laboratory and the DSSOPT, enabling early precautionary measures and alerts.

The second monitoring system in Macao was set up at Mount Fortress slope slot. It commenced operations in 2020.

Surveying and Mapping

Cartography and Cadastre Bureau

The Cartography and Cadastre Bureau is supervised by the Secretary for Transport and Public Works. It specialises in setting up and maintaining the Government's Geodetic Control Network and Geometric Levelling Network. In addition, the bureau supports land-management activities, drafts maps of various types and scales, and maintains the cadastre management.

Cadastre Management

The Cadastre Division of the Cartography and Cadastre Bureau has operated a cadastral database since 1983. The bureau also produces cadastral maps in accordance with the provisions of the Cadastre Law. The division continuously updates related information. The Cartography and Cadastre Bureau launched the Cadastral Information Net in 2008 and an online shop for cadastral maps in 2011. In 2019 the Cadastral Information Net became accessible on mobile devices.

The Cadastre Division also provides survey information from its database to landowners who need to re-measure land boundaries for valuation, transaction or development purposes.

Land Surveying and Cartography

The Cartography and Cadastre Bureau provides a wide range of land survey and cartography services. It also provides topographical maps at various scales with Chinese and Portuguese footnotes, digital cartography of Macao, printed aerial survey photos taken in 1941, 1980, 1988, 1993 and 1998, posters, the map of the Macao SAR and its peripheral regions, and thematic maps.

Satellite Positioning Reference Station

The Cartography and Cadastre Bureau opened three Global Positioning System (GPS) reference stations – at Mount Fortress, Alto de Coloane and Taipa Grande on Taipa island in 2002, 2005 and 2008, respectively. The reference stations can receive both GPS signals as well as data from the Russian GLONASS system (Global Navigation Satellite System) and effectively cover the whole of Macao, further enhancing land, cadastral and engineering surveys of Macao, as well as data collection for the Geographic Information System (GIS).

In 2009, the Macao Satellite Positioning Reference Station Service (mosref.dsc.gov.mo) was launched, making satellite reference data officially available to the public, through registration. In addition, an NTRIP (Networked Transport of RTCM via Internet Protocol) service was launched in 2012. Real Time Kinematic (RTK) corrections were provided to professional users through 3G mobile communication and internet technologies, enabling them to use real-time GPS applications that are accurate to within a centimetre.

In 2013, the bureau and Hong Kong's Lands Department shared data from their own satellite positioning reference stations. The bureau also expanded the coverage of real-time dynamic positioning services to the waters between Hong Kong and Macao and the western part of Hong Kong, thereby providing a more stable and reliable satellite positioning service to all users.

Geographic Information System

In response to society's needs, the Cartography and Cadastre Bureau has introduced various kinds of geographic information systems, including the Cadastre Information Web (cadastre.gis.gov.mo), a comprehensive land information platform that combines information from various departments on land and buildings. Users can inquire about land grants, easement and commitment, buildings, locations, drawing easement, plans for urban conditions, prior approval for buildings under construction, maximum altitude for buildings in the neighbouring area of the Guia Lighthouse, lists of historic urban areas and heritage under conservation, boundary of the special administrative region, and other pertinent information.

In addition, the website contains statistical data, executive procedures and laws related to land. By the end of 2020, the website had received over 1.37 million visitors since its launch in 2008. The website supports desktop and mobile devices, meeting the needs of different users.

The Macao Online Map (webmap.gis.gov.mo) provides geographical information to meet citizens' everyday needs in traditional Chinese, simplified Chinese, Portuguese and English. Users can search for 50 kinds of useful information in everyday life, including on buildings, streets, government departments, tourist spots, food and beverage, and emergency shelters in Macao – catering to needs including eating, housing, transportation, sports and recreation.

To accord with the Government's policy to create an accessible environment, nine walking routes were included in the Macao Online Map, providing information on recommended walking routes and time required. In 2020, Macao 3D Map was launched. This supports mobile devices, allowing the public to visualise a three-dimensional picture of the whole of Macao from multiple viewing angles. Since its launch in 2001 till the end of 2020, the online map has received more

than seven million visitors.

In line with the development of information technology and in response to public demand, in 2012 the Cartography and Cadastre Bureau introduced the Macao Map iOS/Android (Apps). In addition to searches for buildings, streets and street numbers, the application also allows users to search for nearby points of interest and share information about attractions, and can show aerial photographs and offline maps, providing on-the-go geographic information required by users.

An updated version of the Macao Map was published in 2018, followed by an updated version for Android in 2020, with enhanced route planning function integrating all smart footpaths and vehicle road networks throughout Macao, providing the shortest routes of four travel categories – walking, leisure, bus routes and driving.

There is also a personal computer version of Macao Map. Apart from viewing a map and searching for locations, users of this version can also search for the shortest route using the electronic road maps, which are free for citizens and tourists to download.

In 2014, the Cartography and Cadastre Bureau introduced the Macao Street Number Inquiry System (webmap.gis.gov.mo/AddressSearch/chn) based on the Macao Online Map, which provides a street number inquiry service with a simple operating interface.

GeoGuide for Emergency is a mobile geographical app launched by the Cartography and Cadastre Bureau with the support of the Unitary Police Service, the Meteorological and Geophysical Bureau (SMG), the Environmental Protection Bureau, the Marine and Water Bureau, the Education and Youth Affairs Bureau (DSEJ), the Social Welfare Bureau and the Municipal Affairs Bureau. It provides the public with alerts about regions that may be affected during all levels of storm surge, as well as areas that are expected to be affected by suspension of power, real-time alerts about bad weather, emergency shelter locations and emergency telephone numbers in Macao, via mobile phones.

An updated version was launched in 2020, with newly added advance planning of the nearest route to a shelter on foot, information on temporary garbage collection points during emergencies, updated information on water supplies, environmental hygiene instructions during storm surges, and real time rainstorm warnings.

The Traffic and Geographic Information Web (traffic.gis.gov.mo) is a cooperative project between the Cartography and Cadastre Bureau and the Transport Bureau, providing locations of roadworks in progress or to soon commence, and related traffic diversions in Macao.

The Environmental Geographic Information System (gis.dspa.gov.mo) was jointly created by the Environmental Protection Bureau and the Cartography and Cadastre Bureau for the provision of shared map service. The system publishes environmental data and related processed information through the Internet.

The Cadastral Information Net (intranet version) provides real-time land information for public works, housing, land planning and management, environment supervision and municipal administration. As well as information available on the Cadastral Information Net, the intranet version provides Government departments with information such as forms of land use, aerial photos and satellite photos over the years, land area and housing record codes.

Office for the Development of the Energy Sector

The Office for the Development of the Energy Sector (GDSE) was established on 1 January 2005 under Executive Order No. 11/2005, and is under the supervision of the Secretary for Transport and Public Works. Its purpose is to promote and coordinate all activities related to the energy sector, and thus help to implement the Government's energy policy.

The office's major functions are to assist the Government in formulating policies for the energy sector; formulate development plans and related laws and regulations, and follow up on and monitor their implementation; coordinate, promote the study of and monitor the efficiency, impacts on the environment, prices and services, and technical regulations of energy products.

By Amendment of By-law No. 14/2009 on the Organisational Structure and Operations of Environmental Protection Bureau, the functions of the Office for the Development of the Energy Sector (GDSE) were merged into Environmental Protection Bureau effective from January 1, 2021.

Electric Power

In 2020, Macao continued to strengthen regional cooperation in the electric power industry, and took the initiative to foster development of power supplies. Regarding the third circuit of the 220kV Macao-Zhuhai electric power transmission channel, 2020 saw the start of substation construction, targeted for completion and operations as soon as possible, to meet needs until 2025.

At the end of 2020, 11 outdoor transmission facilities had been installed and were already operational in Macao. The Government will continue identifying appropriate locations in old districts for installation of transmission facilities. The Government is also working with the Municipal Affairs Bureau to proceed with the joint construction of three landfills and substations.

As regards preventing and responding to disasters, the Government followed up on the comments and recommendations of the National Commission for Disaster Reduction's Expert Group. As a result, to ensure external power supplies, China Southern Power Grid enhanced the wind resistance of its power grid, added sources of power as well as complementary supplies. Underground works for major power supply routes from mainland China to Macao were launched, to further increase the reliability of cross-border power supplies. Moreover, the Government continued to press forward with an initiative on using a new system for generating electricity from natural gas. As regards the enhancement of transmission networks in low-lying areas, over 205 substations were improved in 2020.

In 2020, to lower burdens on residents, the Government continued to offer the electricity fee subsidy of 200 patacas per month per household.

Moreover, to cope with the pandemic, the Government introduced an electricity fee subsidy for three months for residential and commercial users, sponsoring the fees charged in the March, April and May bills. For commercial users, the subsidy was capped at 10,000 patacas per month each. The cost of electricity bill subsidies for residential and commercial users totalled over 450 million patacas.

Natural Gas

Following the completion of the natural gas pipeline network in Cotai, the construction of the natural gas pipeline network was gradually extended to the Macao Peninsula. In 2020, 16 kilometres of the Macao peninsula's main natural gas pipeline (about 34 kilometres) was installed (representing 47 percent completion). The plan for construction of Macao-Taipa cross-harbour gas supply pipeline was confirmed, and related works soon commenced.

Utility Tunnels

Following the signing of a concession contract regarding management of government utility tunnels, work proceeded on utility tunnel construction at New Urban Zone Area A.

Energy Efficiency and Conservation

Since the launch of the initiative to install light-vehicle charging spaces at public carparks in 2016, the objective of installing 200 public charging spaces as specified in The Five-Year Development Plan of the Macao Special Administrative Region was met by 2020. These light-vehicle charging spaces span 42 public carparks and seven public roads, providing a free charging service to citizens.

As regards promotion of energy-saving LED lights, the Government plans to replace all street lights in Macao with LED lights, to save energy and for aesthetic enhancement and safety. By the end of 2020, LED street lights already accounted for about 50 percent of Macao's street lights.

Macao Energy Saving Week was again held during the year.

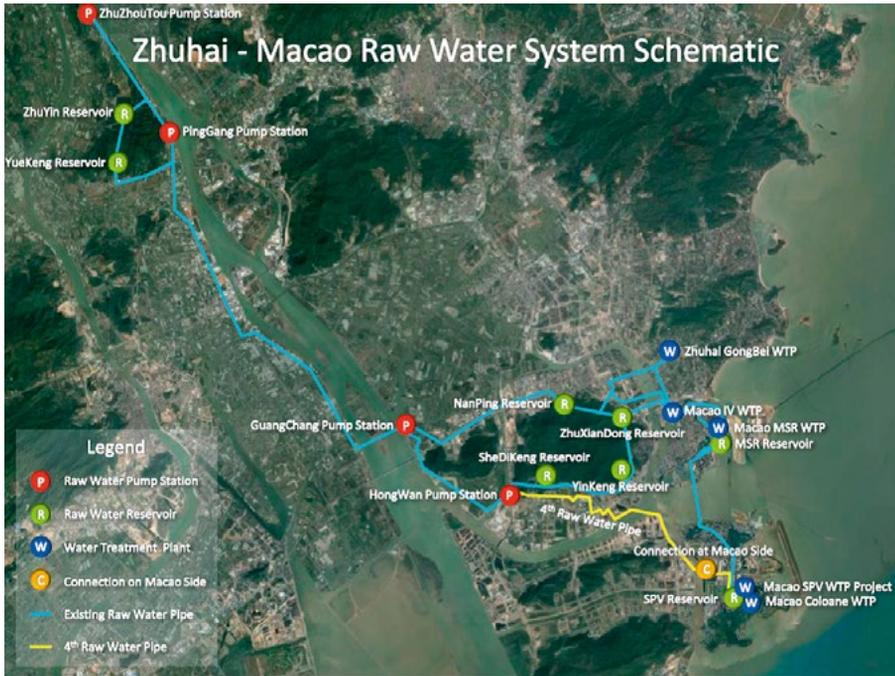
Drinking Water

Macao Water Supply Company (or “Macao Water”)

The Macao Water Supply Company (Macao Water) was established in 1935, and is privately owned. SUEZ NWS Limited, formerly known as Sino-French Holdings (Hong Kong), which is a joint venture between the French-based Suez Lyonnaise des Eaux Group and NWS Holdings, acquired 85 percent of the company's shares in 1985, and signed a 25-year water-supply concession contract with the former Portuguese administration. In 2009, the contract was extended for 20 years to 2030.

Raw Water Supply

Macao's raw water supply from Zhuhai has two main components: the southern pumping station opened in 1988 and part of the Zhuyin Pumping Station opened in 2007. The two stations are connected by the Guangchang Pumping Station. The layout of the whole system is shown in the map below.



On the map, the red labels mark the locations of four major raw water booster pumping stations, for which Zhuzhoutou, Pinggang and Guangchang are the major water inlets. Some 95 percent or more of Macao's raw water comes from Xijiang (West River). In the past ten years, to mitigate salinity effects, the raw water intakes located at Modaomen, Zhuhai, have been moved over 20 kilometres upstream.

The green labels identify reservoirs. Recently, to mitigate salinity effects, the Zhuyin Reservoir was built in Pinggang with a total volume of 43 million cubic metres, and became operational in autumn 2011.

The pipeline with yellow labels is the fourth raw water pipeline, which began supplying water to Macao in the fourth quarter of 2019. The pipeline transfers raw water to Seac Pai Van Reservoir directly from Hongwan pumping station.

In 2020, Zhuhai supplied about 263,000 cubic metres of water to Macao each day, totalling 96.25 million cubic metres of raw water throughout the year. The water quality was certified as Grade II, according to mainland China's Environmental Quality Standards for Surface Water (GB3838-2002), except during occasional salt tides in winter and spring.

Water Treatment, Storage and Transportation

Macao's water treatment capacity is currently 520,000 cubic metres per day. The combined storage capacity of Macao's reservoirs (including the clean water pond and high pool in the water treatment

works) is 76,000 cubic metres. In 2020, the total length of main pipelines was 628 kilometres.

At the end of 2020, the total volume of raw water stored in Macao's reservoirs (including the Main Storage Reservoir, the Outer Harbour Reservoir and the Seac Pai Van Reservoir) was 1.92 million cubic metres, including 1.68 million cubic metres in the reservoir near the Outer Harbour.

A total of 93.03 million cubic metres of water were supplied in 2020, 7.6 percent less than in 2019. The daily average volume supplied in 2020 was around 254,000 cubic metres, with a maximum of 298,000 cubic metres recorded on 16 January. In 2020, the total capacity of water sales was 85.52 million cubic metres, with a daily average of 234,000 cubic metres.

Testing Water Potability

The Macao Water Laboratory and Research Centre shoulders the responsibility of testing water quality, and ensuring the quality of water supplies. On a daily basis, the Laboratory and Research Centre and Municipal Affairs Bureau Laboratory jointly analyse random water samples taken from water processing plants and sampling points of pipelines every day. The quality of water from the water processing plants has always reached the standard specified in the contract signed with the Government and the potable water standard stated in Annex One of the Macao Drainage Regulations. In addition to water quality monitoring and testing of treated water, the Laboratory and Research Centre of Macao Water also monitors the quality of raw water supplies from Zhuhai to Macao and reservoirs in Macao, and issues warnings if pollution is detected; and provides firsthand information on raw water for production purposes, to ensure the water is safe for consumption.

In 2000, the Laboratory and Research Centre was issued a Laboratory Accreditation Certificate of ISO/IEC17025 Standard by the China National Accreditation Service for Conformity Assessment (CNAS).

Over the years, the Laboratory and Research Centre has achieved distinguished results in the inter-laboratory sample checks administered by its parent company—Lyonnaise des Eaux Group, and has been repeatedly regarded as a reference laboratory within the group.

Customer Services

Macao Water promptly and properly handles customer enquiries and provides customer services through a consolidated customer information system. Over the years, it continues to improve its services by providing convenient payment and enquiry services, exploring communication channels for customers, and actively fulfilling its corporate social responsibility.

Macao Water has continued to develop a variety of payment platforms that allow customers to pay charges flexibly. It has launched several convenient electronic services, including an official website, QR codes in water bills, electronic billing, a safe email box co-established with the Macao Post and Telecommunications Bureau, and an official WeChat account, allowing residents to easily handle water supply services.

Macao Water has set up a customer liaison group and a customer service unit to facilitate closer liaison with customers.

To raise public awareness about saving water, Macao Water fully supports the Government in the new water charges system, which was introduced on 1 January 2011. This was the first time an itemised and sliding scale of water tariffs was launched, and a waiver of fees was offered for the first five cubic metres of water used by senior citizens with financial difficulties and individuals who receive the Social Welfare Bureau's single-parent or medical subsidies or subsidies for the disabled.

As at the end of 2020, Macao Water had 263,465 customer water metres, in 231,295 households, 29,837 companies and 2,333 Government institutions.

Supporting Sustainable Development

As a public enterprise, Macao Water has taken up the social responsibility of caring, environment protection and sustainable development. Its corporate social responsibility committee is responsible for leading and supervising the consistent execution of sustainability initiatives in the company's operations and decision making. Since 2010, Macao Water has published annual sustainable development reports in line with international standards, as specified in the core requirements of the G4 Guidelines of the Global Reporting Initiative, leading to Macao Water being awarded the "Services Institution with Verified Disclosure" logo. In 2020, Macao Water was honoured with the Best Sustainability Report for Non-listed Company in Hong Kong ESG Reporting Awards 2020.

Starting from 2000, Macao Water was awarded the CNAS-CL01 (in compliance with ISO/IEC 17025) Accreditation Criteria for the Competency of Testing and Calibration Laboratories by Laboratory and Research Centre of Macao Water, ISO 9001 Quality Management System Accreditation, an OHSAS 18001 Occupational Health and Safety Management System certificate, an ISO 14000 Environmental Management certificate, an ISO 22000 Food Safety Management System Certificate, an ISO 50001 Energy Management System certificate, and an ISO 27001 Information Security Management System certificate.

Power Supply

Companhia de Electricidade de Macau

Companhia de Electricidade de Macau (CEM) is a public utility company with the sole concession to generate, transmit, distribute and sell high, medium and low voltage electricity in Macao. The total capacity of CEM's power generation equipment is 408 MW.

From 1906 to 1972, the electricity supply service was managed by the Macao Electric Lighting Company, headquartered in Hong Kong. In 1972, the company was replaced by CEM.

CEM was restructured with the former Portuguese administration's support in 1982. In 1984, CEM was linked to the Guangdong Power Grid through two 110 kV overhead lines. Cables of the power grid were modified, upgraded and added multiple times in 2006, 2007, 2008 and 2015. As a result, there are six 220 kV power cables with a transmission capacity of 2,100 MVA.

In November 2010, the Government and the CEM signed a contract stipulating a 15-year extension to power supply services. The new contract terms came into effect on 1 December 2010.

Since 1987, the Government, which was previously the largest shareholder in CEM, has reduced

its holding to just eight percent. Currently, 63 percent of CEM's shares are owned by two major shareholders: Nam Kwong Development (HK) Limited, which holds 42 percent, and Energy Asia Consultancy Limited, which holds 21 percent. Moreover, Polytec Industrial Limited and Asiainvest (IP Holding) hold 11 percent and 10 percent, respectively. China Power International Holding holds six percent of the shares, and other investors own the remaining two percent.

Electricity consumption in Macao increased rapidly during the 1990s. In 1998, CEM decided to invest in developing Coloane B Power Station, which uses multi-cycle gas turbine technology.

Conditions of Operations

In 2020, CEM's capacity peaked at 955 MW on 16 July, ten percent lower than the peak capacity in 2019.

The Macao electricity transmission network comprises 26 primary substations, eight high-voltage substations and 1,010 kilometres of 66 kV high-voltage cables, 110 kV cables and 220 kV cables. The Guangdong-Macao electricity network included two 110 kV cables and two 220 kV cables. The 110 kV cables were connected to Gongbei Substation and Nanping Substation, while the 220 kV cables were connected to Zhuhai Substation and Qinyun Substation.

The 11 kV medium-voltage electricity transmission network comprises 1,584 user transformer rooms (11 kV/400 V) and 43 mid-voltage substations, and is connected by cables with a total length of 2,450 kilometres. The low-voltage transmission network comprises 977 kilometres of cable, while the street lighting network comprises 578 kilometres of cable and 15,910 streetlights. CEM's power network almost entirely comprises underground cables.

Electricity Output and Consumption

CEM generated 373 GWh of electricity during 2020, a decrease of 39.1 percent from 2019. The amount of electricity imported from mainland China was 4,853 GWh, an increase of 2.5 percent over 2019, accounting for 90.2 percent of total electricity consumption; and electricity purchased from the Macao Central Incineration Centre totalled 152 GWh. CEM's sales for 2020 totalled 5,182 GWh.

Customer Services

CEM established the CEM Customer Liaison Committee in 2000. With its members coming from 25 different community organisations, the committee serves to reflect public views of CEM's services, and to receive and make suggestions for improvement. At the end of 2020, CEM was providing services to 272,346 households. The Macao peninsula accounted for 80.57 percent of the total customer base; Taipa, 13.86 percent; Coloane, 5.51 percent; Cotai, 0.01 percent; and Hengqin, 0.05 percent.

Including 11,350 light poles and 4,560 wall-mounted streetlights.



A bird's eye view of my home





Appreciating the beauty of Macao from different angles under a blue sky – a panoramic view of the sea and scenery around the Macao peninsula, the Islands District, Hengqin and Hong Kong-Zhuhai-Macao Bridge.

A scenic overlook at New Urban Zone Area A, where 28,000 public housing units are under construction and will help meet Macao's housing needs.

Coastal reclamation work is progressing at New Urban Zone Area C in the former sea area off Taipa Ocean Garden and at New Urban Zone Area E1 and E2 in the north-east corner of Taipa.

The Cotai and Coloane, balancing Macao's development and nature conservation.

Overlooking Macao from the sky, one sees hopes and visions.

