JFM Green Bond
Impact Report 2021

JFM

Japan Finance Organization for Municipalities

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About This Report

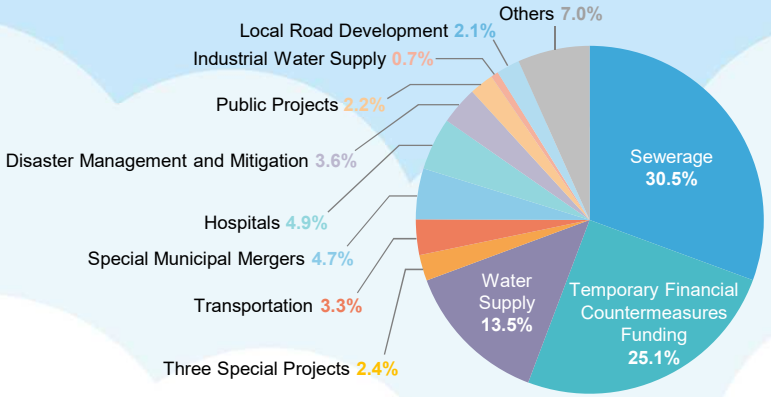
Japan Finance Organization for Municipalities (JFM) provides loans to projects operated by local governments. As of 31 March 2021, total outstanding loans stood JPY 23.1443 tn, of which JPY 7.0674 tn was for sewerage, accounting for 30.5% of the total amount.

JFM issued its second green bonds in February 2021 to finance the Japanese local governments' sewerage projects and fully allocated the net proceeds by 30 March 2021 after issuance.

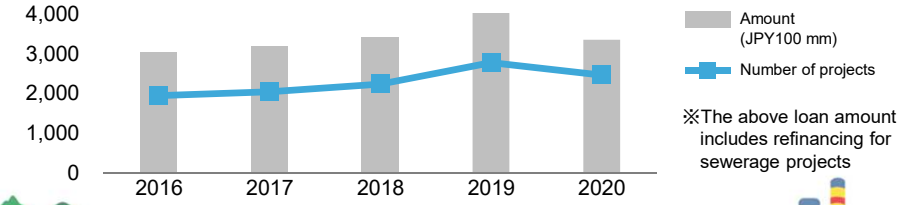
JFM conducted a survey to 63 local governments selected by JFM's Green Bond Working Group where loans were made between 4 February and 30 March 2021 and of which the loan amount for the project was JPY 300 mm or higher in principle and obtained effective response from 55 local governments. (Total loan amount: approximately JPY 80 bn, effective response rate: 87%)

In this report, JFM put together the overview of each sewerage projects which JFM financed and its environmental impacts including impact indicators based on the response in the survey. The objective of this report is to actively disclose to investors the Japanese local governments' efforts on SDGs and the environmental impact of each projects.

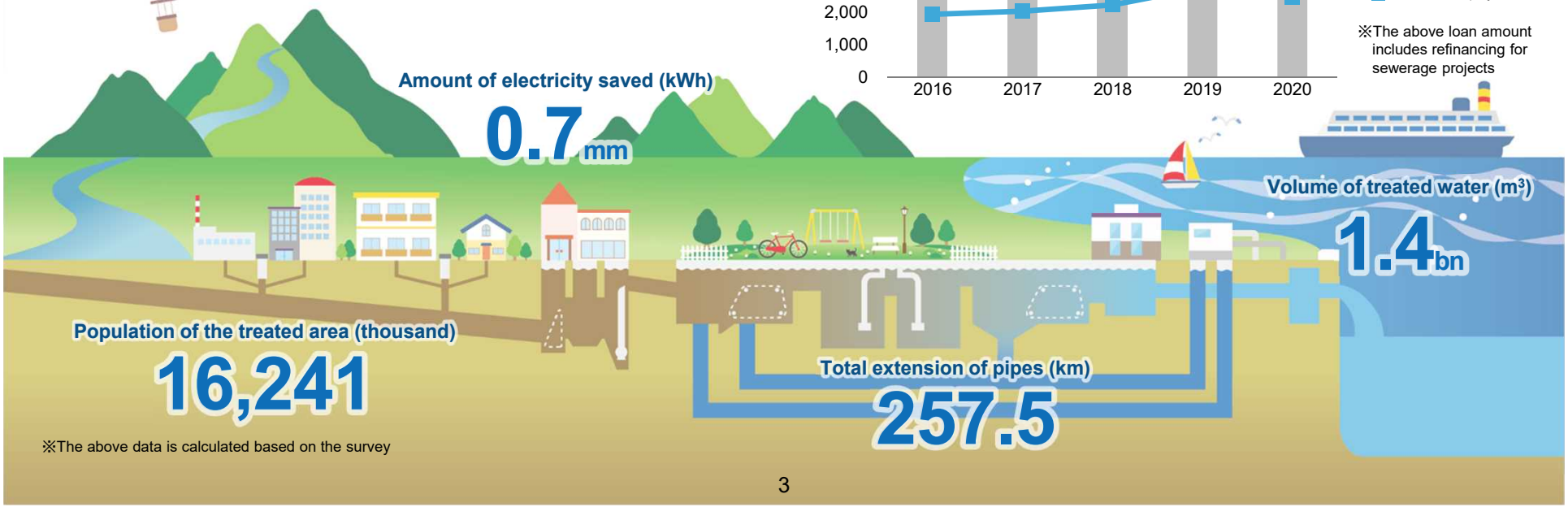
JFM's Loan Portfolio by Project Types



The amount and number of JFM loans made for sewerage projects



※The above loan amount includes refinancing for sewerage projects



※The above data is calculated based on the survey

Executive Summary

- JFM provides loans to local governments on SDGs related projects. Sewerage projects take up a large portion of JFM's total lending, which reaches about JPY 300 ~ 400 bn annually.
- On the back of the growing global concerns on SDGs, JFM issued EUR 500 mm second green bond in February 2021, in order to promote actively the Japanese local governments' efforts on SDGs and to secure stable provision of long-term funding at low interest rates.
- JFM's green bond has been certified by Vigeo Eiris, a second-party opinion provider, and has attained the highest level of assurance.

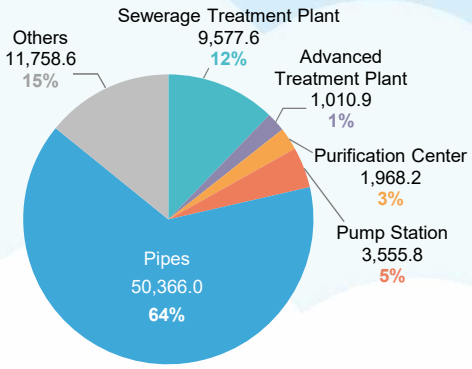
Summary of Terms - Green Bond

Bond Ratings	A1 / A+ (Moody's / S&P)
Tenor	7-year
Issue Amount	EUR 500 mm
Pricing Date	27 January 2021
Issue Date	2 February 2021
Maturity Date	2 February 2028
Coupon	0.010 %
Second-party Opinion Provider	Vigeo Eiris
Assurance Level	Reasonable (Highest level)

- The breakdown of the sewerage projects related loans by JFM FY2020 is as follows

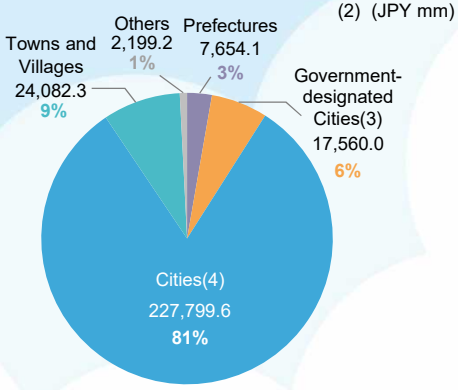
Loan Amount by Project Type

(1) (JPY mm)



Loan Amount by Type of Borrower

(2) (JPY mm)



(1) Breakdown of green bond allocated projects (Approximately JPY 80 bn)
(2) Breakdown of sewerage project loans from 1 April 2020 to 31 March 2021
(3) Cities with populations of 500,000 or more designated by the government
(4) Excluding government-designated cities

- JFM has conducted surveys to relevant local government borrowers in order to measure the environmental impact of their sewerage projects. Loans from 4 February to 30 March 2021 were targeted for the survey, and the refinancing rate for sewerage projects was 0%. Moreover, the following effects were observed:

Summary of Survey Results

Total extension of pipes (km)	Covered area population	Water management capacity (m³)	Amount of electricity saved (kWh)
257.5	16,241,585	1,483,283,167	785,819

※The number of the survey sample for local governments was 63, and 55 returned effective response (87%)

※Summary Methodology

- **Total extension of pipes is addition of new constructed pipes**
- **Covered area population is addition of new pipes, new/renewal of sewerage related facilities**
- **Water management capacity is addition of annual planned/ actual water management capacity in sewerage related facilities**
- **Amount of electricity saved is addition of monthly planned/actual electricity saved**

JFM and Sewerage

JFM was established as a joint funding organization wholly owned by all Japanese local governments and has provided long-term and low-interest-rate loans to local governments. JFM has supported local governments' finance in the capital markets and has contributed to their sound financial management and promoted the welfare of their residents.

Local governments, amidst a decrease in population, are facing various administrative demand, such as the revitalization of regions, measures against the declining birth rate and an aging population, deteriorating infrastructure, measures against large-scale and intensifying natural disasters.

To address these challenges, JFM has provided loans to local governments who develop infrastructure and administrative services to their residents and has contributed to sustainable development of the community and environment.

Japan Finance Organization for Municipalities
President and CEO
SATO Fumitoshi

Sewerage, which covers the largest portion of JFM's loan portfolio, is managed by local governments and the quality of water is regulated under the laws of Japan. Sewerage plays an important role and contributes to the improvement of living conditions, prevention of floods and preservation of water quality through waste water treatment and rain water drainage. The national government and the local governments have worked together to create a sustainable sewerage system such as measures against aging facilities and minimizing the effect of national disasters and JFM contributes to a sustainable development of the system by providing loans to local governments.

The Japanese government has set specific targets on sewerage business based on the Paris Agreement, by setting environmental measures such as sludge recycle rate. Moreover, in accordance with the Act on Promoting of Global Warming Countermeasures and its related policies, Japan has set a policy goal of achieving the utilization rate of sewage sludge as energy such as biomass power generation.

JFM SDGs Related Lending Operations

Sewerage

Purification Center

Water Supply / Industrial Water Supply

Water Supply Plant

Transportation

Tramway

Hospitals and Elderly Care Services

Hospital

Disaster Management and Mitigation

Tsunami Evacuation Tower

JFM Green Bond Framework

January 2020

Approach to Sustainability

- Local Governance in Japan and JFM's contribution
  - ＊SDGs Mapping-Fund Usage by JFM, 31.6% (As of 31 March 2019) are financed for Sewerage projects
- Development of Sewerage System in Japan
  - ＊Sewerage business is operated by municipalities and quality of water is regulated under laws of Japan
- Further initiatives and towards achievement of SDGs

Rationale for Issuance

- Sewerage industry can contribute to a sustainable economy and public health
- JFM hopes to broaden its investor base by attracting green bond investors

Eligibility Criteria

- Eligibility Criteria for JFM green bond is as set forth on the table below

GBP Eligible Green Project Category	Eligibility Criteria	Environmental Objective	Alignment with UN SDGs
Sustainable water and wastewater management Pollution Prevention and Control	Development, construction, maintenance, updates, operation of sewerage related assets, which are in line with sewage drainage standards set by Japanese law including: ▪ Pipes ▪ Sewerage Management Related Facilities ▪ Facility/Equipment	Pollution Prevention and Control Natural Water Resource Conservation Energy use of sewage sludge, sewerage sludge recycle	

Alignment with the Green Bond Principle, 2018（GBP）

- JFM's Green Bond Framework is aligned with four core components of the GBP

1 Use of Proceeds

- An amount equal to the net proceeds will be allocated to the Eligible Green Projects set forth below

2 Process for Project Evaluation and Selection

- JFM Loan Department will confirm that the borrower has obtained consent or approval on the borrowing from relevant authorities
- Green Bond Working Group will conduct a survey to municipalities to determine the effective portfolio

3 Management of the Proceeds

- JFM's Green Bond Working Group will track, monitor and account for the allocation of the proceeds

4 Reporting

- JFM Green Bond Working Group will conduct a survey on municipal borrowers with respect to the environmental impacts of sewerage projects
- JFM Green Bond Working Group will then report the effective portfolio for the allocation which only includes projects that borrowers return effective response
- JFM will publish the following impact report on website annually
  - Amounted of net proceeds of the Notes allocated
  - Break down of Effective Portfolio
  - Expected or estimated KPIs
  - Case studies of JFM's lending to sewerage projects
  - Refinacing rate

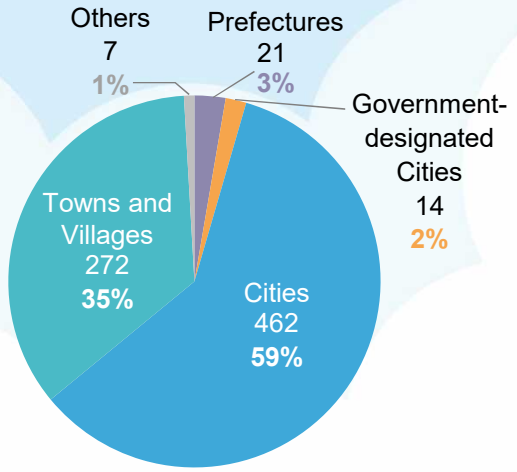
(i) Amount of Loan to Sewerage Projects

	Prefectures	Designated Cities	Cities	Towns and Villages	Others	Total
Number of Local Governments	21	14	462	272	7	776
Number of Loans	34	38	1,547	580	20	2,219
Loan Amount (JPY million)	7,654.1	17,560.0	227,799.6	24,082.3	2,199.2	279,295.2

	JPY 2 bn or over	JPY 1 bn or over	JPY 500 mm or over	JPY 100 mm or over	Below JPY 100 mm	Total
Number of Loans by Loan Amount	7	34	89	524	1,565	2,219

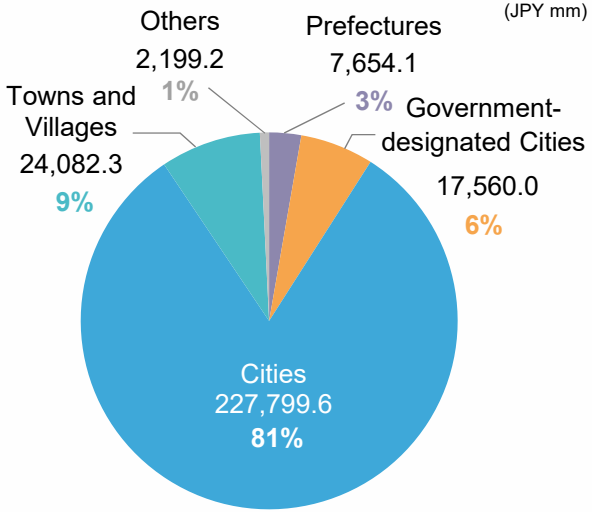
- The total loan amount to sewerage projects from 1 April 2020 to 31 Mach 2021 (excluding refinance) was JPY 279.3 bn.
- The number of local governments was 776, and the number of loans was 2,219. In terms of types of borrowers, cities were the highest with 81%, followed by towns and villages with 9%, then government-designated cities with 6%.
- In terms of the number of loans by loan amount, JPY 2 bn or over was 7, JPY 1 bn or over was 34, JPY 500 mm or over was 89, JPY 100 mm or over was 524 and below JPY 100 mm was 1,565.

Number of Local Governments by Type of Borrower



Loan Amount by Type of Borrower

(JPY mm)



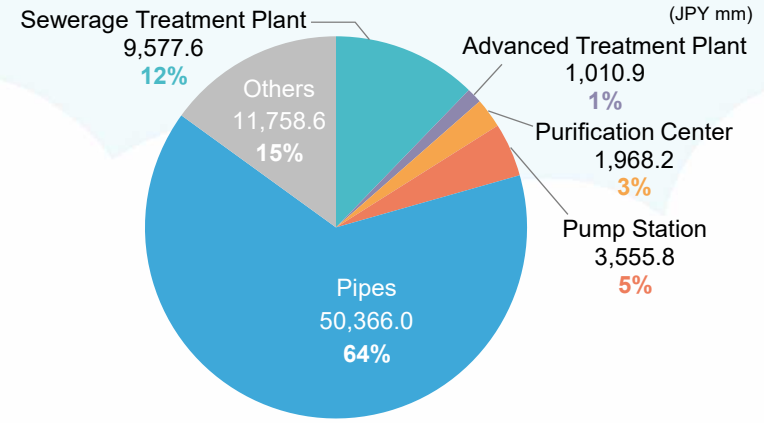
(ii) Breakdown of Green Bond Effective Portfolio

	Sewerage Treatment Plant	Advanced Treatment Plant	Purification Center	Pump Station	Pipes	Others	Total
Number of Projects by Type	41	3	8	25	74	21	172
Loan Amount by Type (JPY million)	9,577.6	1,010.9	1,968.2	3,555.8	50,366.0	11,758.6	78,237.1

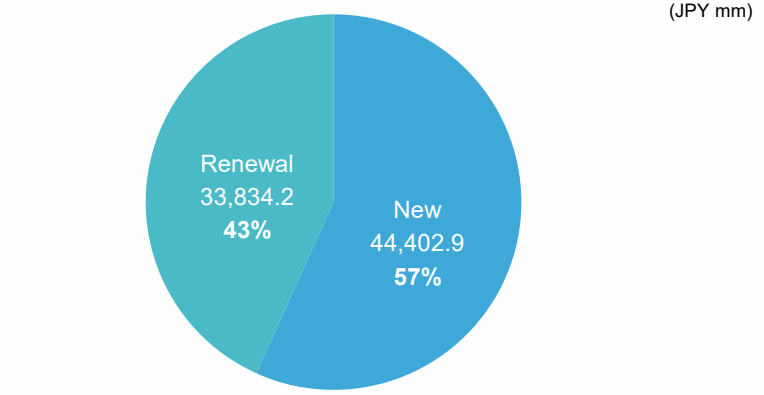
	New	Renewal	Total
Number of Projects by Type	76	96	172
Loan Amount by Type (JPY million)	44,402.9	33,834.2	78,237.1

- The Green Bond Working Group has selected 63 local governments which JFM financed for sewerage projects between 4 February 2021 and 30 March 2021 with the loan amount over JPY 300 mm in principle and conducted a survey for the purpose of this green bonds reporting. The working group obtained effective response from 55 local governments (effective response rate:87%) and a total of approximately JPY 80 bn in loan amount.
- The table above shows the survey results from relevant local governments. Regarding the types of projects by loan amount allocated through the Green Bond, pipes cover the largest portion with 64%, followed by sewerage treatment plant with 12%, then pump station with 5%. Additionally, 57% of the loan amount to sewerage projects was financed to new facilities and 43% was for renewal.

Loan Amount by Project Type



New/Renewal percentage



(iii) Project by project reporting Sewerage Treatment Plant 1

Sewerage Treatment Plant (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	Water Quality (BOD) (Year/Period Average) (mg/L)	Water Quality (phosphorus) (Year/Period Average) (mg/L)	Other positive environmental impact
Utsunomiya City	Tochigi	Install additional sewerage treatment plant facilities	833,158	388,400	46.62	467,819 → 469,342	82,917,793 (annual total)	13.0	2.0 (unchanged)	▪ Electricity consumption (actual annual total) 19,212,075 kWh → 18,807,821 kWh
Fujisawa City (1)	Kanagawa	Tsujido Purification Center: Build a rainwater pool that tentatively accumulates rainwater flowing into the center to apply advanced treatment on sunny days	96,758	93,600	96.74	209,250 (estimate)	N/A	15.0	N/A	▪ Tentatively accumulate rainwater flowing into the center at the rainwater pool to apply advanced treatment on sunny days to reduce the pollutant load of effluents by 89t a year
Fujisawa City (2)			90,000	90,000	100.00					
Fujisawa City (3)		Build additional water intakes with new squeeze pumps in sewerage treatment plants	65,835	45,100	68.50		37,291,470 (annual total)			N/A
Nagano City	Nagano	Install 12 purification tanks	15,180	5,200	34.26	6,744	N/A	N/A	N/A	▪ Installation of purification tanks will help increase the population connected to sewerage system
Toyohashi City	Aichi	Install a mainline of the wastewater pipe and pumping system at Nakajima Treatment Facility to take over combined wastewater previously treated at Noda Treatment Facility for the purpose of reducing loads on the aging Noda facility with insufficient seismic capacity	566,626	315,225	55.63	264,873	25,815,208 → 28,539,882 (annual total)	15.0	1.8 (unchanged)	▪ Reduce loads on the aging Noda facility ▪ Electricity consumption (actual annual total) 11,946,940 kWh → 11,667,372 kWh
Hatsukaichi City (1)	Hiroshima	Build additional sewerage treatment plants with mechanical / electrical equipment	356,070	149,000	41.85	N/A	N/A	15.0	3.0	▪ Conservation of the public water quality based on the stable sludge treatment by building an adequate number of adequate-size facilities to address the sludge inflow
Hatsukaichi City (2)		Build new sewerage treatment plants	86,382	65,100	75.36	49,643 → 52,206	5,107,568	15.0	3.0	
Niihama City (1)	Ehime	Build new facilities for joint treatment at Niihama City Sewerage Treatment Plant	1,620,000	382,700	23.62	87,510	12,231,776 → 14,067,100 (annual total)	N/A	N/A	▪ Reduce electricity consumption by closing Niihama City's sanitation center 7,716,343 kWh (actual annual total) → 6,000,000 kWh (annual estimate)
Niihama City (2)		Build new facilities for joint treatment at Niihama City Sewerage Treatment Plant to address the aging sanitation center of the city, which treats human waste and purification tank sludge	8,814,663	278,800	3.16					▪ Installation of new pipes will increase water treatment volume by 6,900 ㎥ (estimate, monthly average) ▪ Reduce electricity consumption by ~1,800,000 kWh a year (approx. 70%) by closing Niihama City's sanitation center
Total Amount of Sewerage Treatment Plant (9 projects)			12,544,672	1,813,125						

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Sewerage Treatment Plant 2

Sewerage Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	BOD Planned [Year/Period Average] (mg/L)	BOD Actual [Maximum monthly results] (mg/L) after treatment	Phosphorus (Year/Period Average) (mg/L)	Phosphorus Actual [Maximum monthly results] (mg/L) after treatment	Other positive environmental impact
Hakodate City	Hokkaido	Upgrade mechanical equipment of the No.3 blower, electrical instrumentation equipment and strainers for deodorizing and clearing	161,582	93,800	58.05	123,471	21,823,623	15.0	12.0	N/A	2.3	N/A
Hachinohe City	Aomori	Build additional water treatment facilities	130,500	86,955	66.63	145,647	N/A	N/A	5.6	N/A	N/A	▪ Electricity consumption (actual annual total) 7,300,884 kWh → 6,872,910 kWh
Akita City	Akita	Upgrade treatment centers	205,896	100,900	49.01	40,330	9,764,880	15.0	3.2	N/A	0.5	▪ Electricity consumption (actual average monthly total) 326,263 kWh → 187,087 kWh
Iwaki City (1)	Fukushima	Upgrade and renovate treatment centers	817,554	455,500	55.71	178,800	25,877,770	15.0	1.5	3.0	Improved 1.2 → 0.3	N/A
Iwaki City (2)			2,051,461	1,017,700	49.61							
Mito City	Ibaraki	Renovate electrical equipment at treatment centers and pump stations	269,800	131,500	48.74	215,632	19,624,221	15.0	6.8	N/A	0.8	N/A
Utsunomiya City	Tochigi	Upgrade facilities operated beyond service life	307,250	125,600	40.88	469,342	82,917,793	13.0	4.2	2.0	3.3	N/A
Chiba City	Chiba	Upgrade water facilities in the central purification center	170,426	102,260	60.00	N/A	N/A	15.0	3.6	N/A	0.2	N/A
Funabashi City	Chiba	Upgrade mechanical / electrical equipment at settling basin	854,129	507,700	59.44	587,262	30,880,940	9.7	2.2	0.5	0.4	▪ Save electricity by intermittent operation of stirrers for reaction tanks in water treatment facilities
Fujisawa City (1)	Kanagawa	Upgrade aging mechanical / electrical equipment of the No.4 operation line at Tsujido Purification Center	132,528	132,400	99.90	209,250	37,291,470	15.0	6.7	N/A	1.5	N/A
Fujisawa City (2)		Upgrade aging mechanical / electrical equipment of final settling tank and blower in the No.1 operation line at Oshimizu Purification Center	214,578	129,000	60.12	183,630	22,282,830	15.0	5.9	N/A	1.7	
Fujisawa City (3)		Upgrade aging mechanical equipment of reaction tank blower accessories at Oshimizu Purification Center	26,235	26,100	99.49							
Fujisawa City (4)		Upgrade aging mechanical / electrical equipment of final settling tank in the No.1 operation line at Oshimizu Purification Center	152,458	121,000	79.37							
Yamato City	Kanagawa	Upgrade and renovate water conduits, settling basin and blowers	570,119	287,400	50.41	N/A	N/A	15.0	3.5	N/A	1.0	▪ Introduce the latest model of high-speed levitated-shaft turbo blowers to reduce power consumption by ~217,000 kWh a year

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Sewerage Treatment Plant 3

Sewerage Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	BOD Planned [Year/Period Average] (mg/L)	BOD Actual [Maximum monthly results] (mg/L) after treatment	Phosphorus (Year/Period Average) (mg/L)	Phosphorus Actual [Maximum monthly results] (mg/L) after treatment	Other positive environmental impact
Toyama Pref.	Toyama	Introduce energy-saving equipment	5,572,035	671,700	12.05	391,427	48,080,876	15.0	5.6	1.8	2.3	▪ Adopt the sludge melting process to reduce volume to one-twentieth of dewatered sludge and one-third of incinerated ash ▪ Prevent chrome and other hazardous heavy metals from leaking ▪ Reduce dioxin by 99.99% or more vs. the statutory standard ▪ Melt sewage sludge to use as roadbed materials, backfilling materials, and aggregate for secondary concrete products
Toyama City	Toyama	Work on detailed design to renovate water treatment facilities at Hamakurosaki Purification Center	31,416	19,167	61.01	327,288	44,973,844	N/A	1.7	N/A	0.7	▪ Electricity consumption (actual annual total) 12,694,050 kWh → 12,162,160 kWh
Nagano City (1)	Nagano	Upgrade and renovate aging East terminal sewerage treatment facilities	32,670	15,600	47.75	144,002	21,552,155	1.4	1.4	N/A	12.0	▪ Electricity consumption (actual annual total) 9,262,407 kWh → 8,891,911 kWh
Nagano City (2)		Upgrade mechanical / electrical equipment at Kinasa Purification Center	18,300	8,886	48.56	447	59,495	15.0	2.6		1.3	▪ Electricity consumption (actual annual total) 58,637 kWh → 52,773 kWh
Nagano City (3)		Upgrade mechanical / electrical equipment at Shinju Shinmachi Purification Center	1,352	719	53.18	1,510	214,985		2.2		1.2	▪ Electricity consumption (actual annual total) 105,559 kWh → 100,281 kWh
Nagano City (4)		Upgrade mechanical / electrical equipment at Toyooka Purification Center	10,320	4,441	43.03	1,054	124,100		0.9		2.9	▪ Electricity consumption (actual annual total) 115,068 kWh → 103,561 kWh
Nagano City (5)		Apply protective coating to extend operating life of a facility in Tairashigaki which treats wastewater from agricultural communities	14,910	7,076	47.46	1,160	48,383	20.0	7.0		0.5	N/A
Nagano City (6)		Replace pumps, check valves and sluice valves to upgrade the manhole pump station in Imoi	29,128	13,824		710	25,545		5.7		2.6	
Gifu City (1)	Gifu	Renovate mechanical / electrical equipment at plants	725,802	364,200	50.18	381,770	47,061,003	15.0	5.1	1.5	0.4	N/A
Gifu City (2)			714,142	373,100	52.24						N/A	
Toyohashi City	Aichi	Work on detailed design to make important facilities more earthquake/tsunami resistant	13,094	6,803	51.96	264,873	28,539,882	15.0	5.8	1.8	Improved 0.6 → 0.5	N/A

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Sewerage Treatment Plant 4

Sewerage Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	BOD Planned [Year/Period Average] (mg/L)	BOD Actual [Maximum monthly results] (mg/L) after treatment	Phosphorus (Year/Period Average) (mg/L)	Phosphorus Actual [Maximum monthly results] (mg/L) after treatment	Other positive environmental impact
Uji City	Kyoto	Improve earthquake resistance and extend the service life of treatment facilities	1,431,145	678,000	47.37	176,890	597,967	10.0	4.4	0.8	Improved 1.6 → 1.5	▪ Electricity consumption (actual average monthly total) 328,726 kWh → 306,320 kWh
Ikeda City	Osaka	Upgrade aging blowers by installing inverter system equipment and extend the life of disinfection equipment	234,200	110,900	47.35	80,808	16,752,708	5.0	1.9	0.8	0.2	▪ Introduction of energy-saving blowers will reduce power consumption ▪ Electricity consumption (actual average monthly total) 500,586 kWh → 479,211 kWh
Moriguchi City	Osaka	Upgrade and renovate sewerage treatment facilities and equipment operated beyond service life	312,697	177,300	56.70	143,497	26,401,884	15.0	3.6	N/A	Improved 1.4 → 1.3	N/A
Himeji City (1)	Hyogo	Upgrade aging sewerage treatment facilities	586,300	586,290	100.00	482,309	66,009,988	15.0	3.1	3.0	1.3	N/A
Himeji City (2)			333,524	333,500	99.99							
Wakayama City	Wakayama	Renovate terminal sewerage treatment plants and treatment facilities operated beyond service life	501,808	248,000	49.42	21,479	1,753,510	15.0	1.5	0.5	0.2	▪ Electricity consumption (actual average monthly total) 592,417 kWh → 535,600 kWh
Yonago City	Tottori	Upgrade water gauges at treatment plants	908	860	94.71	524	3,990	20.0	1.8	4.0	N/A	▪ Upgrade water gauges to obtain numerical data and prepare for emergency, for the sake of proper waste water treatment
Hatsukaichi City	Hiroshima	Upgrade the central monitor and sludge pumps at sewerage treatment plants operated beyond statutory service life	235,098	118,300	50.32	N/A	N/A	15.0	4.8	3.0	0.7	▪ Renewal of aging central monitors will improve management of water quality and operation, expected to lead to stable quality of discharged water and power saving for the facilities
Marugame City	Kagawa	Renovate the aging and non-antiseismic purification center	731,028	526,300	71.99	42,300	7,678,000	3.8	12.3	0.5	1.5	▪ The new purification center, in which treated water is used more effectively, will help reduce GHG emissions with its smaller size and energy-saving equipment
Yatsushiro City	Kumamoto	Introduce stirrers and air diffusers for reaction tanks	416,410	181,700	43.63	51,770	N/A	1.3	2.3	15.4	18.8	▪ Electricity consumption 3,012,063 kWh (actual annual total) → 2,959,435 kWh (annual estimate)
Total Amount of Sewerage Treatment Plant (Renewal) (32 projects)			18,010,803	7,764,481								

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Advanced Treatment Plant

Advanced Treatment Plant (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	Water Quality (BOD) (Year/Period Average) (mg/L)	Water Quality (phosphorus) (Year/Period Average) (mg/L)	Other positive environmental impact
Chiba City	Chiba	Build advanced treatment facilities to replace aging standard activated sludge treatment facilities	1,152,857	553,130	47.98	137,440	N/A	Improved 15.0 → 12.0	N/A	▪ Installation of advanced treatment facilities will improve the quality of discharged water, which helps improve water quality of the Tokyo Bay
Total Amount of Advanced Treatment Plant (New) (1 project)			**1,152,857**	**553,130**						

Advanced Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	BOD Planned [Year/Period Average] (mg/L)	BOD Actual [Maximum monthly results] (mg/L) after treatment	Phosphorus (Year/Period Average) (mg/L)	Phosphorus Actual [Maximum monthly results] (mg/L) after Treatment	Other positive environment impact
Chiba City	Chiba	Extend service life of aging blowers at Nanbu Purification Center	53,636	24,260	45.23	N/A	N/A	N/A	0.9	N/A	1.0	N/A
Shiga Pref.	Shiga	Upgrade and renovate aging facilities at treatment plants	3,657,810	433,500	11.85	795,400	100,058,874	4.8	0.7	0.3	0.1	▪ Reduce GHG emissions by saving power consumption
Total Amount of Advanced Treatment Plant (Renewal) (2 projects)			**3,711,446**	**457,760**								

(iii) Project by project reporting Purification Center

Purification Center (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	BOD Planned [Year/Period Average] (mg/L)	BOD Actual [Maximum monthly results] (mg/L) after treatment	Phosphorus (Year/Period Average) (mg/L)	Phosphorus Actual [Maximum monthly results] (mg/L) after treatment	Other positive environment impact
Asahikawa City	Hokkaido	Renovate the No.1 sludge incinerator at the sewerage treatment center	1,334,989	587,100	43.98	312,600	51,531,342	15.0	3.7	N/A	N/A	▪ The renovation is intended to address the obsolete environmental performance of the aging facilities and to set adequate incineration capacity responding the decreasing population. Replacement of the bubbling fluidized bed sludge incinerator with a turbocharge-type furnace with smaller capacity (80→60t/day) will achieve a 30% cut in power consumption, 20% cut in auxiliary fuel consumption and more than 50% cut in nitrogen monoxide emissions. GHG emissions including power consumption and auxiliary fuel consumption are also reduced by 70% as combustion under pressure creates high temperature combustion zone in the incinerator.
Fujisawa City	Kanagawa	Upgrade mechanical equipment at purification facilities at Tsujido Purification Center	50,848	50,700	99.71	205,350	N/A	N/A	N/A	N/A	N/A	N/A
Yamato City	Kanagawa	Upgrade and renovate pretreatement facilities, conveyors and deodorization equipment, and make the sludge building more quake-resistant	563,847	291,900	51.77	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toyama City	Toyama	Upgrade sludge circulating pumps at Hamakurosaki Purification Center	38,784	19,623	50.60	309,977	N/A	N/A	N/A	N/A	N/A	▪ Electricity consumption (actual annual total) 11,471,808 kWh → 10,950,190 kWh
Wakayama City	Wakayama	Upgrade terminal sewerage treatment plants and treatment facilities operated beyond service life	89,000	36,400	40.90	21,479	N/A	N/A	N/A	N/A	N/A	N/A
Hatsukaichi City	Hiroshima	Upgrade aging sludge dewatering equipment	282,000	120,900	42.87	52,206	5,107,568	15.0	2.7	3.0	Improved 0.9 → 0.7	▪ Renewal of aging sludge dewatering equipment will ensure efficient sludge treatment (conversion to cement and compost), reducing power consumption
Iwakuni City	Yamaguchi	Work on detailed design to Upgrade dewatering equipment at Ichimonji Terminal Sewerage Treatment Plant	18,700	9,350	50.00	43,642	N/A	N/A	N/A	N/A	N/A	N/A
Marugame City (1)	Kagawa	Renovate the aging and non-antiseismic purification center	731,028	526,300	71.99	42,300	N/A	N/A	N/A	N/A	N/A	▪ The new purification center will help reduce GHG emissions with its smaller size and energy-saving equipment
Marugame City (2)			690,740	325,900	47.18							
Total Amount of Purification Center (Renewal) (8 projects)			**3,799,936**	**1,968,173**								

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Pump Station 1

Pump Station (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	Water Quality (BOD) (Year/Period Average) (mg/L)	Water Quality (phosphorus) (Year/Period Average) (mg/L)	Other positive environment impact
Ichikawa City (1)	Chiba	Build new pumping stations required after the reorganization of the district covered by the public sewerage (rainwater) system. The district is located at a low level where natural drainage is difficult, requiring drainage by pumps	559,130	357,300	63.90	N/A	N/A	N/A	N/A	▪ Effectively eliminate landside waters in an area of about 70ha where urban functions and population are concentrated
Ichikawa City (2)			400,367	219,100	54.72					
Matsusaka City	Mie	Build or install new pump station facilities, inflow conduits, inflow waterway conduits, screw pump conduits, lower machine buildings, machine buildings, dust collector buildings, and container buildings	153,850	73,200	47.58	N/A	N/A	N/A	N/A	▪ Contribute to flood control in urban areas by enhancing its capabilities to eliminate landside waters
Wakayama City	Wakayama	Implement measures against flooding by building a new rainwater pump station	36,686	33,300	90.77	N/A	63,756	N/A	N/A	N/A
Yonago City	Tottori	Build a manhole pumping station in areas where pumps are not installed	12,222	11,596	94.88	56,109 → 55,559	10,904,973 → 841,363	N/A	N/A	▪ Reduce the environmental impact of combined treatment septic tanks and relay from pumping to sewerage systems
Hatsukaichi City	Hiroshima	Install additional rainwater pump equipment (a set of mechanical and electrical equipment)	70,021	30,300	43.27	53,272	N/A	N/A	N/A	▪ Contribute to flood control in urban areas by installing additional rainwater pumping equipment
Total Amount of Pump Station (New) (5 projects)			1,232,276	724,796						

Pump Station (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	BOD Planned [Year/Period Average] (mg/L)	BOD Actual [Maximum monthly results] (mg/L) after treatment	Phosphorus (Year/Period Average) (mg/L)	Phosphorus Actual [Maximum monthly results] (mg/L) after treatment	Other positive environment impact
Hakodate City	Hokkaido	Upgrade aging electrical instrumentation equipment at Ugaura Relay Pump Station, No. 5 rainwater pump at Ote Pump Station, and electrical instrumentation equipment at Ote Pump Station	551,007	351,500	63.79	123,471	21,823,623	N/A	N/A	N/A	N/A	N/A
Akita City	Akita	Make facilities and equipment earthquake-resistant	15,084	6,700	44.42	9,900	804,890	N/A	N/A	N/A	N/A	▪ Electricity consumption (actual monthly average) 36,680 kWh → 34,206 kWh
Chiba City	Chiba	Upgrade electric panel equipment due to the aging of Ochi Pump Station	89,100	51,600	57.91	N/A	N/A	N/A	N/A	N/A	N/A	N/A

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Pump Station 2

Pump Station (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	BOD Planned [Year/Period Average] (mg/L)	BOD Actual [Maximum monthly results] (mg/L) after treatment	Phosphorus (Year/Period Average) (mg/L)	Phosphorus Actual [Maximum monthly results] (mg/L) after treatment	Other positive environment impact
Fujisawa City (1)	Kanagawa	Upgrade aging machinery/ equipment in the sewage grit chamber facilities at Muraoka Pump Station	23,320	23,300	99.91	26,760	3,575,160	N/A	N/A	N/A	N/A	N/A
Fujisawa City (2)		Upgrade aging electrical equipment at Enoshima East Pump Station	34,100	34,100	100.00	310	111,599					
Toyama City	Toyama	Renovate facilities at Iwase Wastewater Relay Pump Station and make them quake-resistant	839,036	382,175	45.55	303,506	41,717,000	N/A	N/A	N/A	N/A	▪ Power consumption (actual, annual total) 1,007,634 kWh → 995,968 kWh
Hamamatsu City	Shizuoka	Renovate equipment of a pump station, install pipes, and renovate equipment at a terminal treatment plant	3,999,431	228,800	5.72	N/A	N/A	N/A	N/A	N/A	N/A	▪ Despite an increase in water volumes, power consumption at a pump station decreased by ~20%, by replacing its equipment and systems, whose performance had deteriorated due to aging, with more energy-efficient ones. Accordingly, the environmental impact of water supply was reduced by ~20%.
Toyohashi City (1)	Aichi	Strengthen important facilities by seismic retrofitting	26,016	13,515	51.95	264,873	240,421	N/A	N/A	N/A	N/A	N/A
Toyohashi City (2)			39,762	20,562	51.71		3,634,020					
Tokai City	Aichi	Upgrade a treatment plant, extend the service life of a rainwater pump station and a treatment plant and make them quake-resistant	963,343	402,800	41.81	99,272	9,181,229	15.0	Improved 2.5 → 2.2	1.0	Improved 0.4 → 0.2	▪ Reduce power consumption by introducing ultra-fine air bubble diffusers
Ise City	Mie	Upgrade equipment/systems at a rainwater pump station as part of the regional public sewage systems project	2,607,491	173,400	6.65	66,620	6,016,788	N/A	N/A	N/A	N/A	N/A
Ikeda City	Osaka	Upgrade sewage pumps and make pump buildings earthquake-resistant	69,520	36,000	51.78	80,808	16,752,708	N/A	N/A	N/A	N/A	▪ Reduce power consumption by changing the motor power of the upgraded sewage pumps from 37 kW to 30 kW
Moriguchi City	Osaka	Improve or upgrade pump station systems/ equipment operated beyond service life	322,652	213,300	66.11	143,497	26,401,884	N/A	N/A	N/A	N/A	N/A

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Pump Station 3

Pump Station (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population	Water Management Capacity (㎥)	BOD Planned [Year/Period Average] (mg/L)	BOD Actual [Maximum monthly results] (mg/L) after treatment	Phosphorus (Year/Period Average) (mg/L)	Phosphorus Actual [Maximum monthly results] (mg/L) after treatment	Other positive environment impact
Wakayama City (1)	Wakayama	Renovate a rainwater pump station and upgrade equipment/systems operated beyond service life	603,141	288,300	47.80	N/A	1,105,340	N/A	N/A	N/A	N/A	▪ Electricity consumption (actual monthly average) 48,687 kWh → 43,636 kWh
Wakayama City (2)		Renovate a rainwater pumping station operated beyond service life	228,000	103,600	45.44		851,255					▪ Electricity consumption (actual monthly average) 16,945 kWh → 16,840 kWh
Yonago City (1)	Tottori	Upgrade sewage pumps in a manhole pump station	2,738	2,596	94.81	559	3,856	20.0	3.2	N/A	N/A	▪ Optimize wastewater treatment by upgrading sewage pumps at a manhole pump station
Yonago City (2)						2,156	15,500		2.7			
Yonago City (3)		Upgrade control panels of a manhole pump station	3,632	3,443	94.80	180	5,539		6.6			
Iwakun City (1)	Yamaguchi	Upgrade sewerage pumps (No. 1-3) at Ichimonji Pump Station	57,000	28,500	50.00	43,642	6,444,529	N/A	N/A	N/A	N/A	N/A
Iwakuni City (2)			124,240	62,100	49.98							
Iwakuni City (3)		Work on detailed design to renew manhole pump buildings at Iwakuni Minami Seseragi Center	3,820	1,900	49.74		804,820					
Marugame City	Kagawa	Upgrade all equipment/systems used in pumping stations	690,740	325,900	47.18	49,211	8,657,120	N/A	N/A	N/A	N/A	▪ Reduce CO_2 emissions by using energy-saving equipment
Yatsushiro City	Kumamoto	Upgrade diesel engines for existing pumps	146,600	76,900	52.46	11,044	572,953	N/A	N/A	N/A	N/A	▪ Reduce GHG emissions by reducing exhaust gas and power consumption ▪ Power consumption (actual monthly average) 28,631 kWh → 21,370 kWh
Total Amount of Pump Station (Renewal) (20 projects)			11,439,773	2,830,991								

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Pipes 1

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population	Positive environment impact
Asahikawa City	Hokkaido	Construct new rainwater pipes	453,013	234,400	51.74	477	67	▪ The extension of sewer pipes will increase the amount of treated water by 13,394 ㎥ (FY2020 estimates, annual total)
Tomakomai City	Hokkaido	Construct new sewer pipes	1,543,246	1,096,300	71.04	1,739	168,481	▪ Conservation of water quality in public water areas, flood control measures
Hachinohe City	Aomori	Extend sewer pipes and reduce uncovered areas	1,179,014	927,345	78.65	18,121	2,481	▪ The extension of sewer pipes has increased the amount of treated water by 276,188 ㎥ (actual, annual total)
Morioka City	Iwate	Develop a sewer pipe network in uncovered areas and construct rainwater drainage facilities as a flood control measure	1,028,069	695,500	67.65	19,075	260,152	▪ The extension of sewer pipes has increased the amount of treated water by 419,645.82 ㎥ (actual, annual total) ▪ Creation of more comfortable and hygienic living environment and conservation of water quality in public water areas ▪ Prevent flood damage through rain water drainage
Sendai City *	Miyagi	Construct new sewer pipes to secure a backup function in the event of a disaster on the main line sewer pipes	700,049	351,775	50.25	N/A	753,054	N/A
Akita City	Akita	Construct new sewer pipes in sewerage uncovered areas	1,879,289	1,098,900	58.47	8,276	595	▪ The extension of sewer pipes will increase the amount of treated water by 77,928 ㎥ (estimates, monthly average) ▪ Conservation of water quality by expanding the sewerage covered areas
Iwaki City (1)	Fukushima	Construct new waste water pipes in sewerage uncovered areas	92,286	90,700	98.28	443	178,000	▪ The extension of sewer pipes will increase the amount of treated water by 1,737.4 ㎥ (estimates, monthly average)
Iwaki City (2) *		Construct new rainwater pipes as a flood control measure	26,266	19,800	75.38	N/A	N/A	N/A
Iwaki City (3)		Construct new waste water pipes in sewerage uncovered areas	345,774	323,900	93.67	1,049	178,000	▪ The extension of sewer pipes will increase the amount of treated water by 6,106.45 ㎥ (estimates, monthly average)
Iwaki City (4) *		Construct new rainwater pipes as a flood control measure	46,346	28,800	62.14	N/A	N/A	N/A
Mito City	Ibaraki	Construct new sewer pipes	1,481,120	1,150,000	77.64	7,252	215,632	▪ The extension of sewer pipes has increased the amount of treated water by 362,281 ㎥ (actual, annual total) ▪ Improvement of public health and water quality in public water areas owing to the increase in the households using flush toilets
Utsunomiya City	Tochigi	Construct new sewer pipes in uncovered areas under the public sewerage system and the specific environmental protection sewerage systems	279,201	215,800	77.29	6,022	469,342	▪ Improvement of living environment through appropriate sewerage treatment
Kasukabe City	Saitama	Construct new public sewer pipes	552,853	545,000	98.58	3,400	209,346	▪ The extension of sewer pipes will increase the amount of treated water by 68,602 ㎥ (estimates, monthly average)

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan
*** Not included in the calculation of total newly constructed pipe length on the summary page**

(iii) Project by project reporting Pipes 2

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population	Positive environment impact
Misato City (1)	Saitama	Expand sewerage covered areas to improve public health, and promote new sewer pipe construction projects including associated outsourcing of design, research and other services, in order to prevent water pollution in public water. Install earthquake-resistant pipes	738,741	548,900	74.30	6,616	124,906	▪ The extension of sewer pipes will increase the amount of treated water by 377,402 ㎥ (estimates, annual total) ▪ Improvement of water quality by eliminating waste water inflow of domestic waste water to river ▪ Prevention of bad odor and harmful insect caused by domestic waste water
Misato City (2)		Expand sewerage covered areas to improve public health, and promote new sewer pipe construction projects including associated outsourcing of design, research and other services, in order to prevent water pollution in public water	668,495	524,400	78.44	5,653	128,403	▪ The extension of sewer pipes will increase the amount of treated water by 387,970 ㎥ (estimates, annual total) ▪ Improvement of water quality by eliminating waste water inflow of domestic waste water to river ▪ Prevention of bad odor and harmful insect caused by domestic waste water
Chiba City (1)	Chiba	Design and construct rainwater pipes and install manhole toilets to secure the sewerage system in the event of earthquakes	605,969	459,385	75.81	1,775	N/A	▪ The construction of rainwater pipes has reduced flood damage
Chiba City (2)		Design and construct rainwater pipes, etc.	440,100	310,270	70.50	429		
Ichikawa City (1)	Chiba	Construct new rainwater pipes in uncovered areas where public sewerage (rainwater) system has not been developed, in order to reduce flood damage in populated areas where urban functions are concentrated	294,576	211,900	71.93	114	73	▪ The extension of sewer pipes will increase the amount of treated water by 3,973,536 ㎥ (estimates, annual total) ▪ The number of house damages has declined in the populated areas where rainwater pipes have been installed
Ichikawa City (2) *			236,354	177,200	74.97	N/A	N/A	▪ The number of house damages has declined in the populated areas where rainwater pipes have been installed
Ichikawa City (3)		Construct new waste water pipes in uncovered areas where public sewerage (waste water) system has not been developed, in order to improve public health and conserve water quality in public water areas	1,385,396	984,600	71.07	9,234	3,110	▪ The extension of sewer pipes will increase the amount of treated water by 414,330 ㎥ (estimates, annual total) ▪ Improvement of water quality in public water areas by replacing single septic tanks with the public sewerage system ▪ Improvement of water quality in gutters and rivers by reducing discharge of untreated domestic waste water
Ichikawa City (4)			2,189,773	1,638,800	74.84	1,798	377	▪ The extension of sewer pipes will increase the amount of treated water by 50,226 ㎥ (estimates, annual total) ▪ Improvement of water quality in public water areas by replacing single septic tanks with the public sewerage system ▪ Improvement of water quality in gutters and rivers by reducing discharge of untreated domestic waste water
Funabashi City (1)	Chiba	Construct new sewer pipes in the area	57,700	39,700	68.80	18,479	587,262	▪ Improvement of water quality ▪ Increase in the sewerage coverage from 88.4% to 90.0% (FY2020)
Funabashi City (2)			2,412,072	1,224,000	50.74			

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan
*** Not included in the calculation of total newly constructed pipe length on the summary page**

(iii) Project by project reporting Pipes 3

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population	Positive environment impact
Matsudo City (1)	Chiba	Construct new sewer pipes in the area	1,159,253	785,400	67.75	11,321	434,736	▪ The extension of sewer pipes will increase the amount of treated water by 860,000 ㎥ (estimates, monthly average) ▪ Improvement of environment and public health owing to the increase in the sewerage coverage ratio
Matsudo City (2)			798,422	511,300	64.04			
Fujisawa City (1)	Kanagawa	Construct effluent pipes based on the emergency plan for improving combined sewerage systems and construct waste water pipes in sewerage uncovered areas	402,471	342,600	85.12	898	N/A	▪ Conservation of water quality in public water areas
Fujisawa City (2)		Construct waste water pipes in conjunction with land development and street construction projects. Install rainwater pipes to secure drainage function as a measure against flooding due to rainfall in urban areas	21,000	10,800	51.43	382	34	▪ The extension of sewer pipes will increase the amount of treated water by 600 ㎥ (estimates, monthly average) ▪ Conservation of water quality in public water areas ▪ Reduction of water pollution in public water areas
Fujisawa City (3)			27,643	9,700	35.09			▪ Conservation of water quality in public water areas ▪ Reduction of water pollution in public water areas
Fujisawa City (4)		Construct effluent pipes	689,881	611,200	88.59	643	N/A	▪ Conservation of water quality in public water areas through appropriate operation of water treatment facilities
Yamato	Kanagawa	Extend sewer pipes	565,401	424,400	75.06	1,192	N/A	N/A
Toyama City	Toyama	Construct new sewer pipes	885,314	543,266	61.36	5,812	384,793	▪ The extension of sewer pipes has increased the amount of treated water by 2,738,518 ㎥ (actual, annual total)
Nagano City	Nagano	Construct new sewer pipes	1,142,169	686,085	60.07	4,219	337,029	▪ The extension of sewer pipes will increase the amount of treated water by 12,000 ㎥ (estimates, annual total) ▪ Increase in the population using flush toilets driven by installing sewer pipes
Gifu City (1)	Gifu	Construct new sewer pipes and drainage channels	459,450	283,500	61.70	4,226	381,770	▪ The extension of sewer pipes has increased the amount of treated water by 677,615 ㎥ (actual, annual total)
Gifu City (2)			158,636	110,700	69.78			
Shimizu -cho (1)	Shizuoka	Construct new sewer pipes to reduce uncovered areas	285,000	200,000	70.18	4,489	22,530	▪ The extension of sewer pipes will increase the amount of treated water by 66,228 ㎥ (estimates, annual total)
Shimizu -cho (2)			440,041	269,000	61.13			
Toyohashi City (1)	Aichi	Construct new sewer pipes	2,002,095	1,129,996	56.44	4,032	264,873	▪ The extension of sewer pipes will increase the amount of treated water by 7,336 ㎥ (estimates, monthly average) ▪ Prevention of public health deterioration by extending the sewer pipe lines ▪ Conservation of water quality in public water areas by switching the combined sewerage system to separated sewerage system
Toyohashi City (2)		Construct rain water pipes	820,154	410,077	50.00	886		▪ Reduction in flood damage ▪ Shift from the combined sewerage system to the separate sewerage system to reduce workload of treatment facilities

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Pipes 4

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population	Positive environment impact
Hekinan City	Aichi	Construct new sewer pipes	2,491,514	1,101,300	44.20	12,858	59,659	▪ The extension of sewer pipes will increase the amount of treated water by 4,349,935 ㎥ (estimates, annual total) ▪ Alleviation of water pollution in lakes and rivers by expanding the coverage of the public sewerage system, which reduces the number of households using septic tanks and vault toilets
Tokai City	Aichi	Construct new sewer pipes to reduce sewerage uncovered areas	757,870	586,600	77.40	3,999	99,272	▪ The extension of sewer pipes will increase the amount of treated water by 96,081 ㎥ (estimates, annual total)
Yokkaichi City	Mie	Construct new sewer pipes in sewerage uncovered areas	4,221,488	2,162,400	51.22	3,339	248,436	▪ The extension of sewer pipes has increased the amount of treated water by 485,716.89 ㎥ (actual, annual total)
Ise City	Mie	Construct new sewer pipes under the regional sewerage system project	2,607,491	1,353,900	51.92	12,183	66,620	▪ The extension of sewer pipes has increased the amount of reated water by 161,294 ㎥ (actual, annual total) ▪ Conservation of water quality in public water areas
Matsuzaka City (1)	Mie	Construct new waste water pipes	2,303,514	1,392,100	60.43	8,580	95,447	▪ The extension of sewer pipes will increase the amount of treated water by 15,570 ㎥ (estimates, monthly average)
Matsuzaka City (2)		Construct new rain water pipes	92,232	81,700	88.58	961	N/A	▪ Reduction in flood damage
Uji City	Kyoto	Construct sewer pipes and rain water storage facilities	1,555,012	979,600	63.00	5,832	176,890	▪ The extension of sewer pipes has increased the amount of treated water by 1,139,000 ㎥ (actual, annual total) ▪ Increase in the sewerage coverage ratio from 95.9% to 96.5% ▪ Improvement in living environment by enhancing water quality in the entire public water areas (pipes construction) ▪ Promotion of flood control measures (develop rain water storage facilities)
Moriguchi City (1)	Osaka	Construct new sewer pipes to be connected to balancing tanks	213,984	119,900	56.03	1,180	143,497	▪ Reduction in flood damage by storing rain water
Moriguchi City (2)			111,968	96,900	86.54			
Moriguchi City (3)			34,100	23,600	69.21	50		
Moriguchi City (4)			55,000	27,500	50.00			
Moriguchi City (5)			93,716	48,700	51.97	12		
Moriguchi City (6)			276,604	172,100	62.22	0		
Yao City	Osaka	Construct new sewer pipes in uncovered areas where public sewerage systems have not been developed	1,642,087	1,340,900	81.66	6,604	696	▪ The extension of sewer pipes has increased the amount of treated water by 277,603 ㎥ (actual, annual total) ▪ Improvement of water quality in public water areas by increasing the sewerage covered area population ▪ Improvement of living environment by increasing the population using flush toilets
Himeji City (1)	Hyogo	Construct new sewer pipes	673,338	673,210	99.98	3,161	482,309	▪ The extension of sewer pipes has increased the amount of treated water by 1,637,316 ㎥ (actual, annual total)
Himeji City (2)			253,425	253,300	99.95			

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Pipes 5

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population	Positive environment impact
Ikaruga -cho	Nara	Construct new sewer pipes to increase the coverage of public sewerage system	545,465	313,200	57.42	3,070	18,555	▪ The extension of sewer pipes will increase the amount of treated water by 54,184 ㎥ (estimates, annual total) ▪ Improvement of river water quality and living environment by increasing the coverage of public sewerage system
Wakayama City (1)	Wakayama	Construct new sewer pipes to improve the coverage of sewerage system and prevent flooding	1,919,951	1,116,100	58.13	7,070	138,918	▪ The extension of sewer pipes will increase the amount of treated water by 252,455 ㎥ (estimates, annual total) ▪ Improvement of the environment of public water areas
Wakayama City (2)			128,267	70,700	55.12	71		▪ The extension of sewer pipes will increase the amount of treated water by 2,538.9 ㎥ (estimates, annual total) ▪ Improvement of the environment of public water areas
Tottori City (1)	Tottori	Construct new sewer pipes to reduce sewerage uncovered areas	78,692	78,692	100.00	378	136	▪ The extension of sewer pipes will increase the amount of treated water by 13,304 ㎥ (estimates, annual total)
Tottori City (2)			545,411	545,411	100.00	2,710	310	▪ The extension of sewer pipes will increase the amount of treated water by 30,324 ㎥ (estimates, annual total)
Yonago City	Tottori	Construct new sewer pipes to reduce sewerage uncovered areas	2,298,516	1,459,066	63.48	9,411	130,966	▪ Reduction of environmental impact by increasing the covered areas of sewerage system to reduce the use of integrated sewage treatment tanks and vault toilets
Fukuyama City (1)	Hiroshima	Construct new sewer pipes	669,876	505,226	75.42	6,938	350,448	▪ The extension of sewer pipes has increased the amount of treated water by 87,348 ㎥ (actual, annual total)
Fukuyama City (2)			140,082	94,082	67.16			
Hatsukaichi City (1)	Hiroshima	Construct new sewer pipes (waste water, rain water) to expand the sewerage covered areas	533,127	295,200	55.37	2,893	68,932	▪ The extension of sewer pipes has increased the amount of treated water by 1,000 ㎥ (Actual, monthly average) ▪ Conservation of water quality, improvement of living environment and prevention of flood damage through the construction of waste water pipes in sewerage uncovered areas
Hatsukaichi City (2)			1,485,342	1,044,300	70.31	9,220	68,401	▪ The extension of sewer pipes has increased the amount of treated water by 489,173 ㎥ (actual, annual total) ▪ Conservation of water quality in public water areas through the construction of waste water pipes in sewerage uncovered areas
Iwakuni City (1)	Yamaguchi	Construct new public sewer pipes (waste water pipes)	1,033,083	593,363	57.44	3,478	43,642	▪ The extension of sewer pipes will increase the amount of treated water by 1,770 ㎥ (estimates, monthly average)
Iwakuni City (2)			1,779,814	252,740	14.20			
Marugame City	Kagawa	Construct new waste water pipes	731,028	526,300	71.99	544	49,211	▪ The extension of sewer pipes has increased the amount of treated water by 160,150 ㎥ (actual, annual total) ▪ Conservation of water quality in public water areas and creation of comfortable living environment through the continuous construction of waste water pipes
Yatsushiro City	Kumamoto	Construct sewer pipes to expand the coverage of the sewerage system	1,454,468	863,400	59.36	4,920	60,053	▪ The extension of sewer pipes has increased the amount of treated water by 132,860 ㎥ (actual, annual total) ▪ Conservation of the environment and water quality
Total Amount of Pipes (new) (50 projects)			59,219,097	37,396,889				

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Pipes 6

Pipes (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Amount of treated water (actual, annual total, before and after renewal) (㎥)	Positive environment impact
Asahikawa City	Hokkaido	Upgrade waste water pipes	508,923	441,100	86.67	78,548 (annual planned volume)	▪ Prevent serious accidents and malfunctions due to aging sewerage facilities (coverage: approx. 2.6 km)
Akita City	Akita	Upgrade or replace pipes	1,136,296	682,900	60.10	34,423,244 → 34,701,894	▪ Conservation of water quality through the installation of sewage pipes in a wider area
Mito City	Ibaraki	Renovate pipe facilities	33,271	32,000	96.18	N/A	N/A
Utsunomiya City	Tochigi	Rehabilitate aging pipes in the public sewerage treatment areas and make pipes earthquake-resistant	697,698	460,700	66.03	89,238,678 → 82,917,793	N/A
Kasukabe City	Saitama	Improve trunk lines of rainwater treatment for flood control in urban areas	373,065	150,000	40.21	N/A	N/A
Chiba City (1)	Chiba	Renovate aging pipes and make pipes earthquake-resistant to ensure a normal performance of sewer systems in the event of a large-scale earthquake	682,475	487,265	71.40	N/A	▪ Ensure drainage performance in the event of a large-scale earthquake
Chiba City (2)			488,760	315,430	64.54		
Ichikawa City (1)	Chiba	Make sewer pipes (which were installed in accordance to the former earthquake-resistant standards and laid under sewerage treatment routes from emergency transportation routes or shelters) earthquake-resistant and install manhole toilets	110,398	60,500	54.80	N/A	▪ Ensure the minimum required processing functions in the event of a large-scale earthquake ▪ Conservation of public health and water quality in the event of a large-scale earthquake
Ichikawa City (2)			196,493	109,100	55.52		
Ichikawa City (3)		Renovate and upgrade aging sewerage systems	40,278	25,000	62.07		▪ Conservation of public health and water quality in public waters
Funabashi City (1)	Chiba	Renovate and repair existing facilities to prevent road collapse due to aging	1,787,100	1,160,300	64.93	N/A	▪ Control soil pollution
Funabashi City (2)			271,180	238,100	87.80		
Hachioji City	Tokyo	Upgrade aging pipes	2,706,785	647,400	23.92	54,543,000	▪ Further improve the water quality of rivers (All rivers in Hachioji meet BOD environmental standards)
Tachikawa City	Tokyo	Construct trunk lines required to be connected to regional sewerage systems	2,001,266	1,019,100	50.92	32,282,737 → 32,066,399	▪ Improve the water quality of public waters (Tama River into which sewage is discharged, which is ultimately discharged into Tokyo Bay) by directing sewage inflow into regional sewerage systems where advanced treatment has been introduced
Fujisawa City (1)	Kanagawa	Implement for aging sewerage duct facilities and make them earthquake resistant	556,621	450,600	80.95	N/A	▪ Prevent road collapse accidents and suspension of treatment functions, and conserve public health and water quality in public waters by taking measures to minimize damage (disaster mitigation) in the event of a disaster
Fujisawa City (2)			135,874	107,800	79.34		
Toyama City	Toyama	Upgrade or replace pipes	2,106,688	1,475,485	70.04	56,120,131 → 58,858,649	N/A

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Pipes 7

Pipes (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Amount of treated water (actual, annual total, before and after renewal) (㎥)	Positive environment impact
Gifu City (1)	Gifu	Replace sewer pipes	609,893	325,100	53.30	57,394,144 → 58,071,759	N/A
Gifu City (2)			67,639	51,600	76.29		
Toyohashi City (1)	Aichi	Upgrade pipes, including reinforcing manholes as part of comprehensive earthquake measures (rehabilitation of aging pipes)	216,576	205,986	95.11	25,815,208 → 25,839,882	▪ Prevent the deterioration of public health by directing sewage to a treatment plant in the event of an emergency (anti-earthquake measures) ▪ Prevent water leakage and the deterioration of public health by extending the life of pipes (rehabilitation of aging pipes)
Toyohashi City (2)		Make pipes earthquake-resistant	67,272	33,636	50.00		▪ Prevent the deterioration of public health by directing sewage to a treatment plant in the event of an emergency
Ikeda City	Osaka	Rehabilitate pipes on aging pipelines	2,658,673	1,458,600	54.86	17,204,214 → 16,752,708	▪ Ensure stable sewage flow to comply with environmental standards
Moriguchi City	Osaka	Rehabilitate pipes, starting with pipes operated beyond service useful life	506,840	504,200	99.48	25,752,741 → 26,401,884	N/A
Yao City	Osaka	Renovate or upgrade aging pipes to improve their performance and extend their life	94,368	94,300	99.93	39,345	▪ Prevent accidents due to road collapse by improving the strength of aging pipes
Higashi Osaka City	Osaka	Upgrade pipes to improve their earthquake-resistance and processing capacity	1,515,650	1,207,300	79.66	N/A	▪ Improve the earthquake resistance and processing capacity of pipes by replacing old existing pipes with new ones
Wakayama City (1)	Wakayama	Renovate or upgrade rainwater pipes. Renovate or upgrade pipes operated beyond services useful life	249,510	182,600	73.18	17,480 (annual planned volume)	N/A
Wakayama City (2)			167,990	89,700	53.40		
Yonago City	Tottori	Design required for renovation of pipes, rehabilitate pipes and design manhole toilets	242,635	146,534	60.39	1,496,818 (monthly actual volume) → 1,383,428 (monthly actual volume)	▪ Ensure stable sewage treatment by repairing corroded pipes
Fukuyama City (1)	Hiroshima	Upgrade or replace pipes	420,889	232,801	55.31	39,361,818 → 41,431,764	N/A
Fukuyama City (2)			564,630	519,273	91.97		
Iwakuni City (1)	Yamaguchi	Upgrade aging pipes	36,837	32,537	88.33	359,736 → 372,134	N/A
Iwakuni City (2)			28,819	22,210	77.07		
Total Amount of Pipes (Renewal) (24 projects)			21,281,392	12,969,157			

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Others 1

Others (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Positive environment impact
Utsunomiya City	Tochigi	Cost for construction of watershed sewerage systems	30,483	26,900	88.25	N/A
Matsudo City	Chiba	Install disaster response generators	20,284	10,142	50.00	N/A
Tachikawa City	Tokyo	Cost for construction of watershed sewerage systems in Tokyo	540,741	540,000	99.86	N/A
Kawasaki City	Kanagawa	Construction of several types of facilities including sewage treatment, advanced treatment, sludge treatment, pumping stations, pipes, etc	18,106,760	669,000	3.69	N/A
Hiratsuka City (1)	Kanagawa	Rebuilt sewerage duct facilities and make them earthquake-resistant, and extend the life of pump stations by making them quake-resistant	1,308,086	648,000	49.54	N/A
Hiratsuka City (2)			1,053,164	631,400	59.95	
Fujisawa City	Kanagawa	Install pipes and equipment for sewers in the Sagami River basin	10,700	10,600	99.07	N/A
Ise City	Mie	Cost for construction of watershed sewerage systems	259,458	259,000	99.82	▪ Conservation of water quality in public waters
Moriguchi City (1)	Osaka	Install manhole toilets and water sources	20,471	17,000	83.04	N/A
Moriguchi City (2)		Relocate water pipes that obstruct the construction of sewers	44,253	44,100	99.65	
Takasago City	Hyogo	Add equipment / facilities for rainwater pumps	1,430,000	633,700	44.31	N/A
Fukuyama City (1)	Hiroshima	Construct new facilities for a rainwater treatment project	316,255	192,347	60.82	N/A
Fukuyama City (2)			420,889	232,801	55.31	
Total Amount of Other facilities (New) (11 projects)			23,561,544	3,914,990		

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iii) Project by project reporting Others 2

Others (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (thousand JPY)	JFM Loan Amount (thousand JPY)	JFM Loan Amount/ Total Project Cost (%)	Positive environment impact
Takasaki City	Gunma	Improve sewage treatment facilities and equipment	609,499	467,100	76.64	N/A
Fujisawa City	Kanagawa	Retrofit in-house power generation buildings of Oshimizu Purification Center for earthquake-resistant	25,470	15,900	62.43	N/A
Yamato City	Kanagawa	Renovate or upgrade substations and private power generation facilities, and reinforce the control building by making it earthquake-resistant	1,078,669	626,700	58.10	N/A
Ise City	Mie	Make the management sludge buildings earthquake-resistant	12,546	5,200	41.45	▪ Extend the life of the facilities by making them quake-resistant
Kobe City	Hyogo	Renovate and upgrade various types of aging facilities, including for sewage treatment, advanced treatment, sludge treatment, pumping stations, pipes, etc., and implement earthquake countermeasures for these facilities	10,771,212	1,983,000	18.41	▪ Reduce GHG emissions in proportion to the reduction in power consumption by replacing equipment
Nishinomiya City (1)	Hyogo	Renovate and upgrade various aging facilities, including facilities for sewage treatment, advanced treatment, sludge treatment, pump stations, pipes, etc.	6,189,895	1,073,600	17.34	N/A
Nishinomiya City (2)			5,970,245	2,052,800	34.38	
Nishinomiya City (3)			400,000	400,000	100.00	
Takasago City	Hyogo	Renovate or upgrade pipes and sewerage facilities	1,477,591	516,000	34.92	▪ Maintain environmental health and prevent environmental and water pollution in public waters
Yonago City (1)	Tottori	Upgrade various facilities, including monitoring and control systems at a treatment plant, sewage pumps, atmospheric pressure flotation devices, instrumentation devices, sewage pumps at pumping stations and manhole pumping stations, reporting devices, water level meters, sand pumps, and local exhaust fans at treatment facilities	287,329	122,779	42.73	▪ Recycle dehydrated sludge (13.1 t/day) generated by sludge treatment as a raw material for coal and cement for fuel, thereby achieving a recycling rate of 100% ▪ Utilize sludge digester gas generated in the sludge treatment process and reuse it as a power source for boilers in treatment facilities ▪ Working on demonstration experiments to generate electricity from sludge digester gas through collaboration with other agencies, aiming to monetize the electricity generated by such method
Yonago City (2)			280,509	133,684	47.66	
Yonago City (3)			31,908	15,141	47.45	
Yonago City (4)			1,732	1,642	94.80	
Yonago City (5)			5,582	5,291	94.79	
Yonago City (6)			1,337	1,267	94.76	
Yonago City (7)			638	605	94.83	
Fukuyama City (1)	Hiroshima	Facilities, etc. for rainwater projects	241,160	117,154	48.58	N/A
Fukuyama City (2)			321,881	193,977	60.26	
Iwakuni City	Yamaguchi	Renovate rainwater drainage facilities	173,800	111,800	64.33	▪ Mitigate flood damage in specified drainage areas ▪ Electricity consumption 317,764 kWh (actual annual total) → 300,000 kWh (annual planned volume)
Total Amount of Other facilities (Renewal) (10 projects)			27,881,003	7,843,640		

※Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several projects in one JFM loan

(iv) Case Study 1: Asahikawa City Sewerage Treatment Center No.1 Sludge Incinerator Renovation Project

No. 1 sludge incineration plant under construction

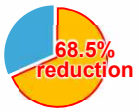
Project Overview (FY2019 - 2022 (Planned))

Total Project Cost: JPY1,225.5 million - of which JFM funds: JPY509.9 million (2020.4 -2021.3)

- Asahikawa City introduced the No. 1 sludge incineration plant (bubble type fluidized bed incinerator (normal combustion)) in 1996 in order to improve the properties of and reduce volume of dewatered sludge against the backdrop of the limited space of its landfill disposal sites.
- Although the city conducted appropriate maintenance and steady operation of the plant, it faced various issues such as aging facilities, obsolete environmental performance and need of reviewing adequate incinerating capabilities along with population decline.
- The city plans to downsize the No. 1 sludge incineration plant (from 80t/day to 60t/day) and upgrade the existing incinerator to a turbocharged fluidized bed incinerator (high-temperature combustion) that reduces GHG emissions and saves energy.
- JFM funds were allocated to the construction of buildings and facilities necessary for the project.

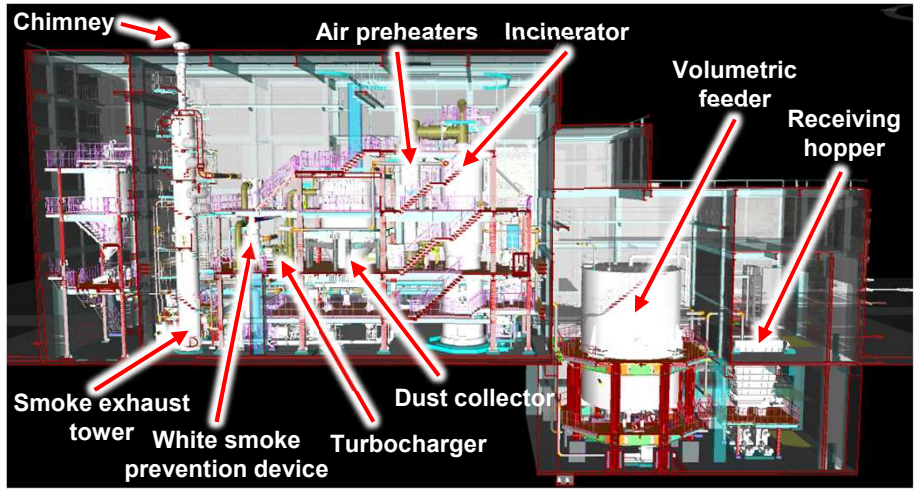
Highlights **Environmental effect of the upgrade to the turbocharged fluidized bed incinerator**

- The introduction of turbocharger utilizing exhaust gas energy enables the incinerator to operate without using “fluidizing blower” sending air into the furnace and “induced draft fan” absorbing exhaust gas.
  → Power consumption can be reduced by 31.2%※
- Compared with the conventional “bubble type,” the turbocharged fluidized bed incineration system combusts sewage sludge under pressure, enabling a downsizing of incinerator
  → Auxiliary fuel (heavy oil) during incineration can be reduced by 18.9%※
- The system enables higher combustion speed and forms a partial high-temperature area in the furnace.
  → N2O emissions can be reduced by more than 57% owing to the high-temperature combustion※



The use of the turbocharged fluidized bed incinerator is expected to reduce greenhouse gas (CO2) emission by 68.5%, if including the effect of reductions in power consumption and auxiliary fuels※

※The amount of reduction is based on the comparison of numerical value per ton of sludge with that of the existing No.1 sludge incinerator.
(based on the technical proposal by manufacturers)



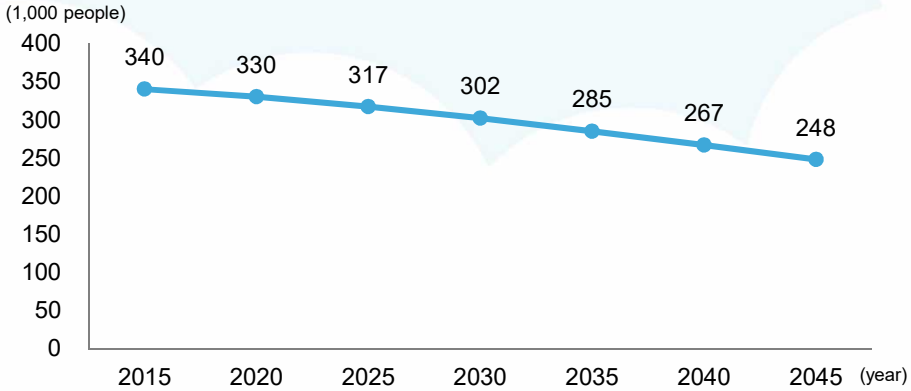
Turbocharged fluidized bed incinerator illustrative image

<Reference> Asahikawa City

DATA

Population	329,306 (as of Oct. 1, 2020; Population Census)
Area	747.66㎢ (as of July 1, 2021; Municipalities Area Statistics of Japan published by the Geospatial Information Authority of Japan)
Sewerage coverage	97.2% (as of Mar. 31, 2021)
City budget	JPY106.13 billion (FY2021 General Account Initial Budget)

Demographic trend



Source: "Population Projections for Japan by Region -2018 projections" published by the National Institute of Population and Social Security Research

Overview

- Asahikawa City located in the center of Hokkaido is a river town where Ishikari River and many tributaries join together and it is a fertile basin surrounded by the Daisetsuzan Mountain Range.
- As a major city in the Northern Hokkaido Area, Asahikawa City plays an important urban function by providing medical and welfare facilities, educational facilities, cultural facilities and public institutions.
- The city is based on various industries including: agriculture such as rice cultivation; foods; paper and pulp; manufacturing including wood products such as furniture; machinery metals; and wholesale, retail and other services as a transportation and logistics base in Northern Hokkaido.
- Additionally, the city has Asahiyama Zoological Park, a nationwide popular zoo known as its unique viewing facilities with features emphasizing animals' natural behavioral tendencies, and the ski resorts boasting quality powder snow, attracting many tourists from home and abroad. Asahikawa Ramen noodle is one of the local gourmet foods in Asahikawa.

Landscape of Asahikawa, a river town

Asahiyama Zoological Park

Asahikawa Ramen

(ⅳ) Case Study 2: Toyama Prefecture Oyabegawa-basin Futagami Purification Center Renovation Project etc.

Sludge Melting Furnace No.3 at Futagami Purification Center

Project Overview (FY2018 - 2022 (Planned))

Total Project Cost: JPY 4,416.3 million - of which JFM funds: JPY 671.7 million (2020.4 -2021.3)

- With over 20 years of operation, Futagami Purification Center had been faced with the issues of increased risk of malfunctions due to the aging of the facilities and increased costs of maintenance and renovation.
- By taking into account the aging of the entire sewerage facilities, the Center formulated in FY2017 "Stock Management Plan" to optimize facility management for the entire facilities.

- During inspections in 2018, it was found that refractories in Sludge Melting Furnace No. 3 at Futagami Purification Center showed a sign of deterioration. In response, the Center started a renovation project to extend its service life in 2019.
- JFM funds are used for a project to extend the life of a sludge melting furnace, to upgrade electrical and mechanical equipment in water treatment facilities, and to reinforce the earthquake resistance of connecting pipes.

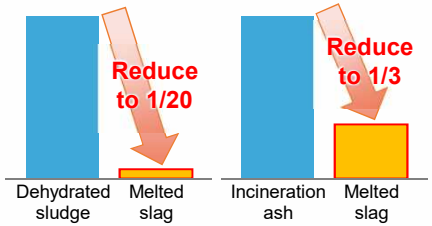
Highlights **Environmental effects by adopting a new sludge melting method***

*A method to convert sewage sludge generated in the process of sewage treatment into slag by melting it at a high temperature (approx. 1,300 ° C)

1 Reduction of volumes

A method to burn organic substance and evaporate moisture to reduce volume to ~1/20 in comparison with dehydrated sludge and to ~ 1/3 in comparison with incinerated ash by the combustion of organic matter and moisture evaporation, which in turn extend the life of final disposal sites (landfill sites).

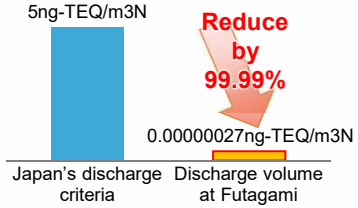
【Reduce the volumes of dehydrated sludge and incinerated ash】



2 Detoxification of organic substance

Oxidize and burn organic substance in the sludge and convert inorganic substance into slag, which makes it possible to stabilize the composition and contain harmful substances (heavy metals) such as chromium. Also reduce dioxins by 99.99% or more from the standard criteria specified by applicable laws.

【Reduce dioxin values from the criteria specified in the Law Concerning Special Measures against Dioxins】



3 Effective use of melted slags

Use compositionally stable melted slag as roadbed materials, backfilling materials, and aggregate for secondary concrete products.

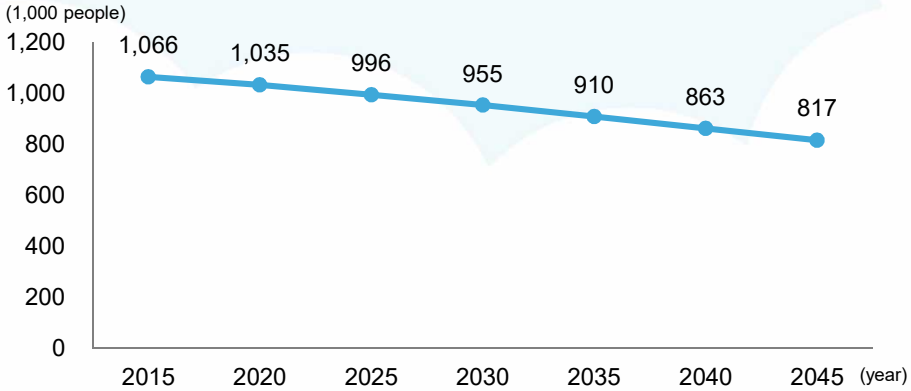
【Melted slag backfill material (use case)】

<Reference> Toyama Prefecture

DATA

Population	1,034,814 (as of Oct.1, 2020; Population Census)
Area	4,247.58㎢ (as of July 1, 2021; Municipalities Area Statistics of Japan published by the Geospatial Information Authority of Japan)
Sewerage coverage	86.4% (as of Mar. 31, 2021)
City budget	JPY633.58 billion (FY2021 General Account Initial Budget)

Demographic trend



Source:"Population Projections for Japan by Region -2018 projections" published by the National Institute of Population and Social Security Research

Overview

- Toyama Prefecture is located in the north-central part of Honshu, the largest of the four main islands of Japan stretching from north to south.
- Surrounded on three sides by steep mountains, a plain spreads around a deep bay. The prefecture is characterized by its well-formed geography, with a radius of 50 km with Toyama City at its center.
- Situated in the center of the Sea of Japan side, Toyama Prefecture is actively engaged in diverse initiatives as a hub of the pan-Japan Sea region, taking advantage of its long-standing exchanges with other countries on the opposite shore, such as those in the Asian continent and the Korean Peninsula.
- The Tateyama Kurobe Alpine Route, one of the world's leading mountain sightseeing routes filled with 3000-meter-high-peaks has long attracted many tourists. Toyama Bay is abundant with a huge diversity of sea life such as firefly squid, yellowtail and white shrimp.

Firefly squid in Toyama Bay

Yellowtail in Toyama Bay

The Tateyama Kurobe Alpine

(iv) Case Study 3: Hamamatsu City Murakushi Relay Pump Station Mechanical Equipment Renovation Project

Murakushi Relay Pump Station

Project Overview (FY2019 - 2020)

Total Project Cost: JPY117.7 million - of which JFM funds: JPY58 million
(2020.4 -2021.3)

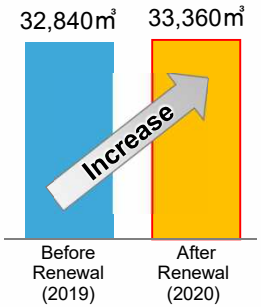
- Murakushi Relay Pump Station was opened to start operation in 1992.
- Located adjacent to Lake Hamana, the Murakushi district has difficulty in installing natural flow-based sewer pipes due to its flat land and high groundwater level. Murakushi is Japan's first pump station and pipes to introduce vacuum sewerage system, in which water is collected and conveyed under vacuum pressure.
- The 27-year-old station's deterioration had been recognized.

- Equipment suffering from poor performance due to aging were replaced with more energy-efficient equipment such as vacuum pumps.
- JFM funds were allocated to upgrade mechanical equipment such as vacuum pumps, water tanks and squeeze pumps, and electrical equipment such as power boards and control boards.

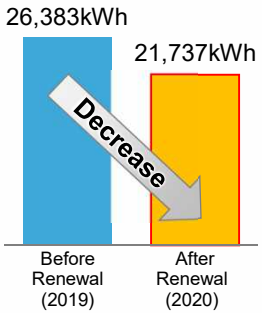
Highlights **Environmental effects with vacuum pumps**

- Environmental load from water conveyance was improved by ~20% from 0.803kWh/㎥ to 0.652kWh/㎥ before and after the renewal, despite an increase in the volume of water conveyed, because the amount of power consumed at the station has decreased.
- New vacuum pumps are equipped with smaller-output electric motors, reducing the amount of power consumption by ~30% to 15,311kWh from 21,145kWh.

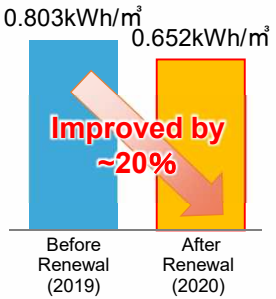
【Volume of water conveyed】



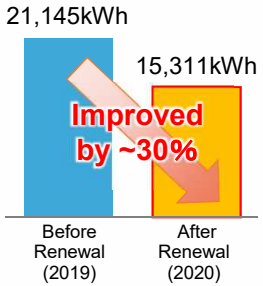
【Electricity consumption】



【Electricity consumption / volume of water conveyed】



【Vacuum pumps electricity consumption】



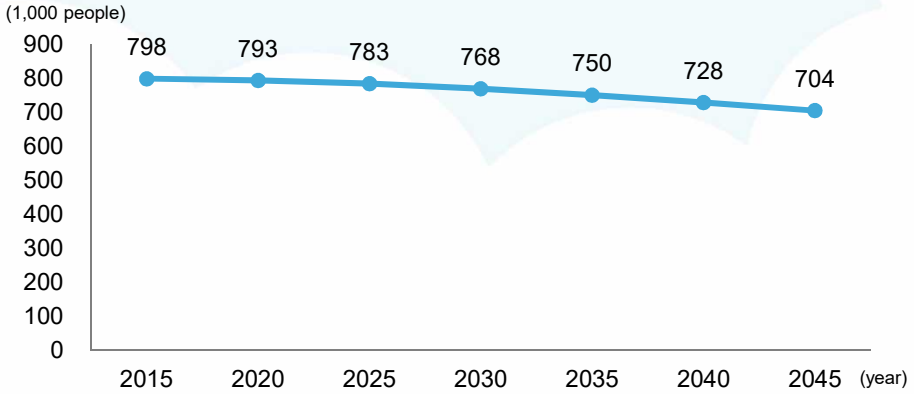
【Vacuum pumps】

<Reference> Hamamatsu City

DATA

Population	790,718 (as of Oct. 1, 2020; Population Census)
Area	1,558.06㎢ (as of July 1, 2021; Municipalities Area Statistics of Japan published by the Geospatial Information Authority of Japan)
Sewerage coverage	81.3% (as of Mar. 31, 2021)
City budget	JPY350.10 billion (FY2021 General Account Initial Budget)

Demographic trend



Source: "Population Projections for Japan by Region -2018 projections" published by the National Institute of Population and Social Security Research

Overview

- Located near the center of Japan and about half way between Tokyo and Osaka, Hamamatsu City in western Shizuoka Prefecture is a town which coexists with the surrounding nature -- mountains, rivers, ocean and a lake.
- It is a government-designated city and second-largest administrative district in terms of land area, consisting of the busy central district developed around Hamamatsu Station and surrounding residential areas.
- Public sewerage system was approved for development in 1959 and started operation in 1966. The city is divided into 11 treatment districts and served by 11 treatment centers and 19 pump stations.
- Hamamatsu is known for Hamamatsu Gyoza (meat dumpling), which ranks top in the household spending for gyoza (according to the government's family budget research), and 450-year-old Hamamatsu Festival, which features kite-flying event.

Hamamatsu Festival

Hamamatsu Gyoza

(ⅳ) Case Study 4: Yonago City Uchihama Sewerage Treatment Plant Monitoring / Control System Renovation Project

Uchihama Sewerage Treatment Plant

Highlights **Environmental effects from the Plant**

- Treat approx. 30,000 ㎥ of sewage/day, 24 hours and 365 days, through processes of water treatment and sludge treatment.
- Process an average of 586 ㎥ of sludge/day. Recycle sludge by discharging dehydrated sludge (13.1 t/day) externally and reuse it as a raw material for fuel charcoal and cement, thereby achieving a recycling rate of 100%.
- Also use digester gas generated in the sludge treatment process to power boilers in the plant for reuse.
- Also work with other agencies on demonstration experiments to generate electricity from digester gas, aiming to trade and monetize digester gas-based electricity in the future (using subsidies of the Ministry of Economy, Trade and Industry of Japan).

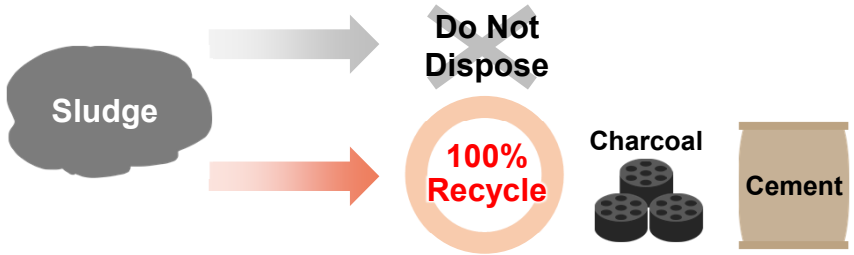
Project Overview (FY2019 - 2020)

Total Project Cost: JPY402.4 million - of which JFM funds: JPY161.0 million (2020.4 -2021.3)

- Uchihama Sewerage Treatment Plant commenced its operation in 1974 and built advanced treatment facilities in 2002. The Plant is also entrusted with sewage treatment from neighboring municipalities.
- The monitoring / control system is used to control the operation of equipment in the treatment plant 24 hours a day, 365 days a year.
- The Plant had been in operation for 45 years and identified deterioration of equipment.

- This project is for the replacement of aging equipment (to maintain the current environmental effects and create new positive effects).
- JFM funds were allocated to equipment required for monitoring of equipment systems used in the Plant.

【Upgraded Monitoring / Control System】



<Reference> Yonago City

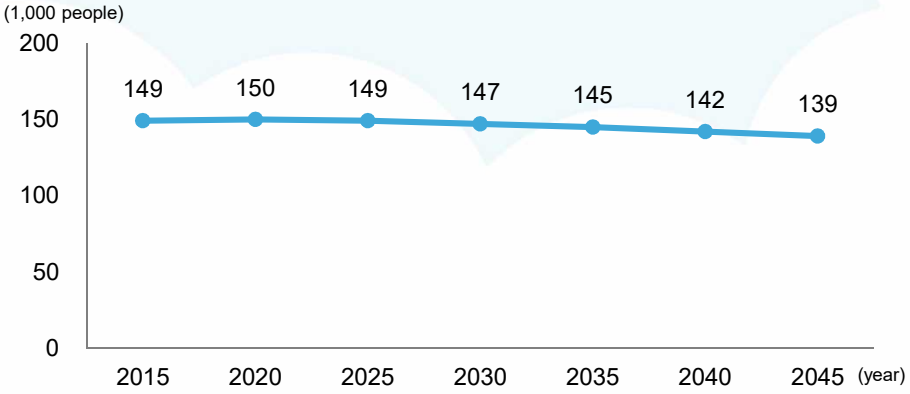
Overview

- Located in the western part of Tottori Prefecture in the center of the Sanin region of Japan, Yonago City is blessed with rich natural environment, with Mt. Daisen, the highest mountain in the Chugoku region to the southeast, the Sea of Japan to the north, and Nakaumi, the southern limit of the Tundra swans' migration path and a Ramsar site, to the west.
- Yonago City has long thrived as the "commercial center of the Sanin region," a hub of regional traffic and accommodations, and a prosperous city that attracts many people. It also has a good access to expressways, railways, and airport. Kaike Onsen, which faces the Sea of Japan, is one of the best hot springs in the Sanin region.
- The City launched its SDGs initiatives based on the "Social Common Capital" advocated by Hirofumi Uzawa, an economist from Yonago City, and had been actively promoting its efforts for SDGs in cooperation with Tottori Prefecture and others.

DATA

Population	147,317 (as of Oct. 1, 2020; Population Census)
Area	132.42㎢ (as of July 1, 2021; Municipalities Area Statistics of Japan published by the Geospatial Information Authority of Japan)
Sewerage coverage	71.6% (as of Mar. 31, 2021)
City budget	JPY103.05 billion (FY2021 General Account Initial Budget)

Demographic trend



Source:"Population Projections for Japan by Region -2018 projections" published by the National Institute of Population and Social Security Research

Kaike Onsen

Tundra swan