JFM Green Bond Impact Report 2023

JFM

Japan Finance Organization for Municipalities

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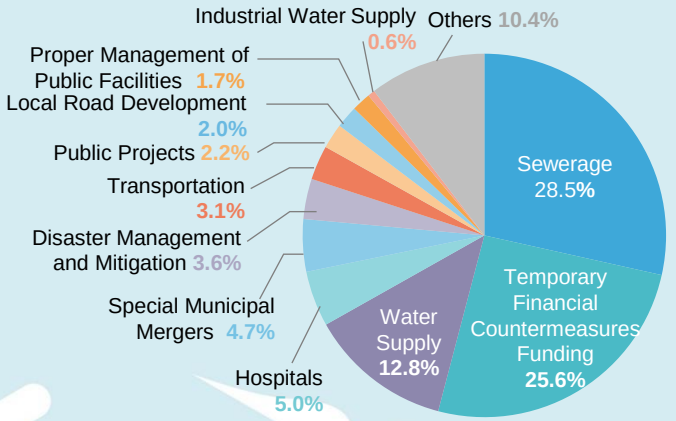
About This Report

Japan Finance Organization for Municipalities (JFM) provides loans to projects operated by local governments. As of 31 March 2023, total outstanding loans stood JPY 23.3tn, of which JPY 6.6tn was for sewerage, accounting for 28.5% of the total amount.

JFM issued its fourth green bond in February 2023 to finance the Japanese local governments' sewerage projects and fully allocated the net proceeds by 30 March 2023 after issuance. Sustainability Working Group established under JFM Sustainability Committee chaired by President and CEO conducted a survey to 74 local governments where loans were made between 27 February 2023 and 30 March 2023 and of which the loan amount for the project was JPY 300mm or higher in principle and obtained effective response from 71 local governments (Total loan amount: approx. JPY 95bn, effective response rate: 96%).

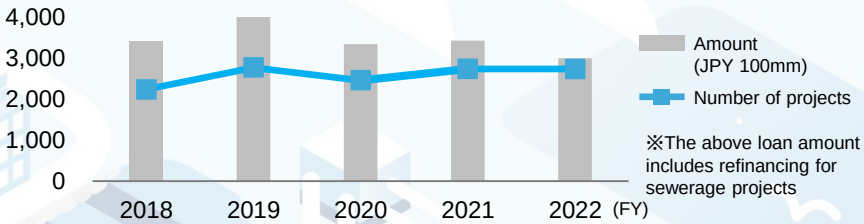
In this report, JFM put together an overview of each sewerage project which JFM financed and its environmental impacts including impact indicators based on the response in the survey. The objective of this report is to actively disclose to investors the Japanese local governments' efforts on SDGs and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

JFM's Loan Portfolio by Project Type



※As of 31 March 2023
※Does not add up to 100 due to rounding off

The amount and number of JFM loans made for sewerage projects



※The above loan amount includes refinancing for sewerage projects

Amount of electricity saved (kWh)
7.3mm

Population of the treated area (thousand)
25,293

Total extension of pipes (km)
340.5

Volume of treated water (m^3)
2.9bn

※The above data is calculated based on the survey
※Amount of electricity saved and volume of treated water are annual figures

Executive Summary

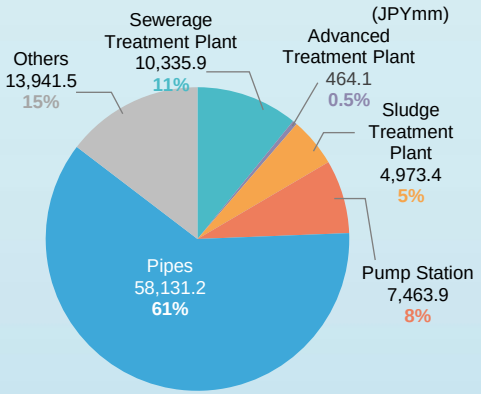
- JFM provides loans to local governments on SDGs-related projects. Sewerage projects take up a large portion of JFM's total lending, which reaches about JPY 300 ~ 400bn annually.
- On the back of the growing global concerns on SDGs, JFM issued EUR 500mm (approx. JPY 71.1bn) green bond in February 2023, 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 received a second-party opinion from Moody's and has attained an SQS2 sustainability quality score (very good).

Summary of Terms - Green Bond

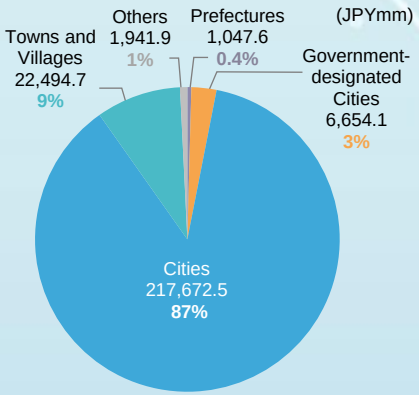
Bond Ratings	A1 / A+ (Moody's / S&P)
Tenor	5 year
Issue Amount	EUR 500 million
Pricing Date	15 February 2023
Issue Date	22 February 2023
Maturity Date	22 February 2028
Coupon	3.375%
Second-party Opinion Provider	Moody's
Sustainability Quality Score	SQS2 (Very good)

- The breakdown of loans to sewerage projects provided by JFM is as follows:

Loan Amount by Project Type※1



Loan Amount by Borrower Type ※2



※1 Breakdown of green bond eligible projects from 27 February 2023 to 30 March 2023 (approx. JPY 95bn)
※2 Breakdown of loans for sewerage projects in FY2022
※3 Does not add up to 100 due to rounding off

- JFM has conducted surveys to relevant local government borrowers in order to measure the environmental impacts of their sewerage projects. Loans from 27 February to 30 March 2023 were targeted for the survey, and the refinancing rate for sewerage projects was 0%. In addition, the following effects were observed:

Summary of Survey Results

Total extension of pipes (km)	Covered area Population	Water management Capacity (㎥)	Amount of electricity saved (kWh)
340.5	25,293,694	2,999,187,751	7,329,619

※The number of the survey sample for local governments was 74, and 71 returned effective response (96%)

※Summary Methodology

1) **Total extension of pipes is addition of new constructed pipes**
2) **Covered area population is calculated by totaling the population (actual, planned, or estimated values) of the covered areas after new construction or renewal/reconstruction of sewage treatment facilities, etc.**
3) **Water management capacity is calculated by totaling the annual volume (actual, planned, or estimated values) of treated water after new construction or renewal/reconstruction of sewage treatment facilities, etc.**
4) **Amount of electricity saved is calculated by totaling the reduction amount (actual, planned, or estimated values) in annual electricity consumption before and after new construction or renewal/reconstruction of sewage treatment facilities, etc.**

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 wastewater 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 and 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

December 2022

Approach to Sustainability

- Local Governance in Japan and JFM's contribution
  - ∗ SDGs Mapping-Fund Usage by JFM, 29.2% (As of 31 March 2022) 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	Development, construction, maintenance, updates, operation of sewerage related assets, which comply with sewage drainage standards set by Japanese law including: ▪ Sewerage Management-Related Facilities ▪ Facility/Equipment ▪ Pipes	Pollution Prevention and Control Water Resource Conservation Energy use of sewage sludge, sewage sludge recycle	

Alignment with the Green Bond Principles, 2021 (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 Proceeds

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

4 Reporting

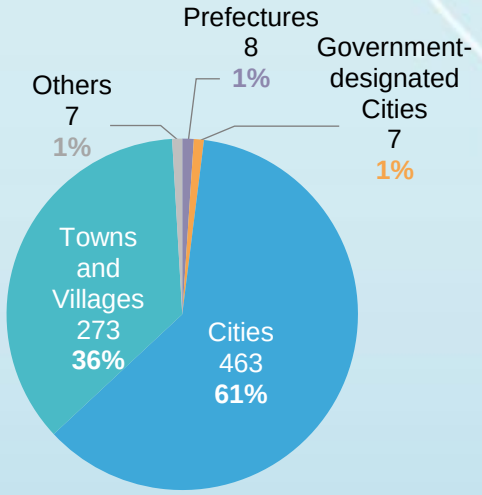
- JFM Green Bond Working Group will conduct a survey of municipal borrowers with respect to the environmental impacts of sewerage projects
- JFM Green Bond Working Group will then report the effective portfolio for the allocation which only includes projects that borrowers return effective response
-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

(i) Amount of Loan to Sewerage Projects

	Prefectures	Government-designated Cities	Cities	Towns and Villages	Others	Total
Number of Local Governments	8	7	463	273	7	758
Number of Loans	12	15	1,771	659	20	2,477
Loan Amount (JPY million)	1,047.6	6,654.1	217,672.5	22,494.7	1,941.9	249,810.8

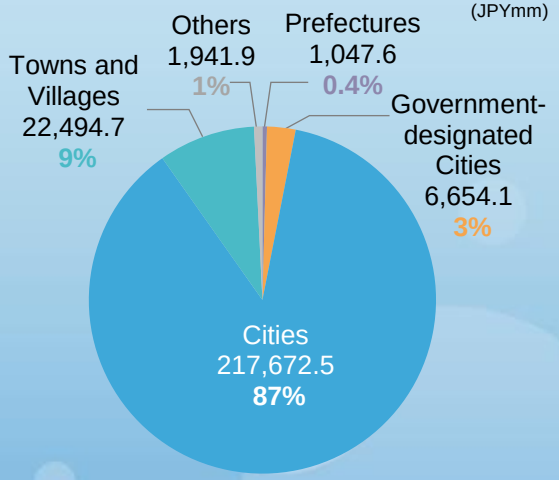
	JPY 2bn or over	JPY 1bn or over	JPY 500mm or over	JPY 100mm or over	Below JPY 100mm	Total
Number of Loans by Loan Amount	3	26	78	486	1,884	2,477

Number of Local Governments by Borrower Type



Loan Amount by Borrower Type

(JPYmm)



※ Does not add up to 100 due to rounding off

- The total loan amount to sewerage projects for FY2022 (1 April 2022 to 31 March 2023) (excluding refinancing) was JPY 249.8bn.
- The number of local governments was 758, and the number of loans was 2,477. In terms of the loan amount by types of borrowers, cities were the highest with 87%, followed by towns and villages with 9%, then government-designated cities with 3%.
- In terms of the number of loans by loan amount, JPY 2bn or over was 3, JPY 1bn or over was 26, JPY 500mm or over was 78, JPY 100mm or over was 486 and below JPY 100mm was 1,884.

(ii) Breakdown of Green Bond Effective Portfolio

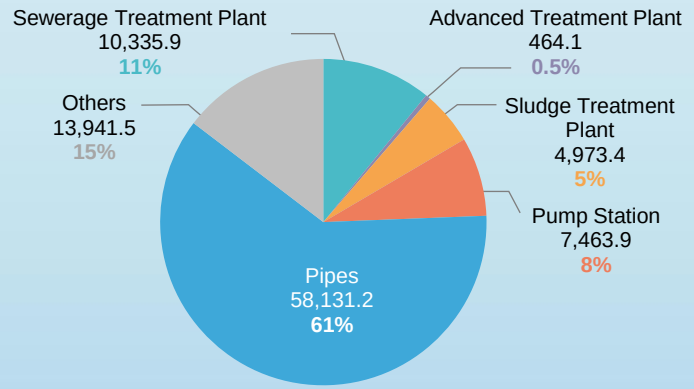
	Sewerage Treatment Plant	Advanced Treatment Plant	Sludge Treatment Plant	Pump Station	Pipes	Others	Total
Number of Projects by Type	54	3	20	53	148	70	348
Loan Amount by Type (JPY million)	10,335.9	464.1	4,973.4	7,463.9	58,131.2	13,941.5	95,310.0

	New	Renewal	Total
Number of Projects by Type	156	192	348
Loan Amount by Type (JPY million)	57,103.1	38,206.9	95,310.0

- JFM Sustainability Working Group has selected 74 local governments which JFM financed for eligible sewerage projects between 27 February 2023 and 30 March 2023 with the loan amount over JPY 300mm in principle and conducted a survey for the purpose of this green bond reporting. The working group obtained effective response from 71 local governments (effective response rate:96%) and a total of approx. JPY 95 bn in loan amount.
- The table above shows the survey results from relevant local governments.
- Regarding the types of projects by loan amount eligible for green bond, pipes cover the largest portion with 61%, followed by sewerage treatment plants with 11%, and then pump stations with 8%.
- Additionally, 60% of the loan amount eligible for green bond was financed to new facilities and 40% was for renewal.

Loan Amount by Project Type

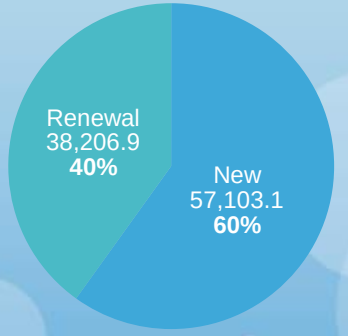
(JPYmm)



※ Does not add up to 100 due to rounding off

New/Renewal percentage

(JPYmm)



(iii) Project by Project Reporting: Sewerage Treatment Plant 1

Sewerage Treatment Plant (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Utsunomiya City	Tochigi	Installation of additional facilities in line with the increase in population within the treated areas	251,377	130,500	51.91	493,032	91,192,377	3.2 →1.75	1.55	▪ Sludge recycling rate 100% (Delivery to recycling plants, composting companies and cement companies) ▪ Annual electricity consumption 19,310,107kWh → 19,014,469kWh
Toyama City	Toyama	Installation of automatic water sampling machines at Hamakurosaki Purification Center to check water quality during water treatment	36,985	15,664	42.35	240,276	39,494,100	4.0	1.0	▪ Use of heat generated during sewerage treatment for the air conditioning facilities in Water and Sewer Bureau office buildings
Nagano City	Nagano	Construction of septic tanks	14,762	8,400	56.90	2,341	142,809	N/A	N/A	▪ Installation of purification tanks will help increase the population connected to sewerage system
Hatsukaichi City（1）	Hiroshima	Expansion of sewerage treatment facilities at Hatsukaichi Purification Center	18,000	9,000	50.00	58,032	5,441,599	6.9	0.9	▪ Improving public health and preserving water quality in public waters by responding to the increase in treated water volume in line with the expansion of treated areas
Hatsukaichi City（2）			197,000	88,600	44.97					
Hatsukaichi City（3）		Expansion of sewerage treatment facilities at Ohno Purification Center	93,290	41,950	44.97	15,368	1,392,113	3.1	1.1	
Iwakuni City	Yamaguchi	Installation of septic tanks	4,143	1,200	28.96	1,639	789	N/A	N/A	N/A
Nagasaki City	Nagasaki	Development of the second basin for the primary sludge thickener facilities at Nanbu Purification Center and renovation of fittings of the in-house power generation room at Seibu Purification Center	102,292	57,026	55.75	N/A	N/A	N/A	N/A	▪ Improvement in sludge treatment efficiency and expected reduction of electricity consumption by using new facilities and equipment
Usa City	Oita	Construction of a new treatment plant and development of sewerage systems in line with the expansion of treated area, etc.	1,600,137	927,100	57.94	21,288	2,427,060	23.6 →20.3	13.4	▪ Improvement in public health by increasing appropriate sewage water treatment volume in line with the expansion of treated areas
Total Amount of Sewerage Treatment Plant (New) (9 projects)			2,317,986	1,279,440						

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

(iii) Project by Project Reporting: Sewerage Treatment Plant 2

Sewerage Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Hakodate City	Hokkaido	Construction of mechanical equipment of the No. 2 blower and electrical instrumentation equipment, etc. due to aging of facilities	139,802	88,300	63.16	111,600	24,398,365	7.4	1.0	▪ Reduction of CO_2 emissions by introducing energy-saving equipment ▪ Annual electricity consumption 4,810,749kWh → 4,772,913kWh
Chitose City	Hokkaido	Renewal of aging hypochlorous acid * storage tanks *Disinfection for discharge of sewage water treated at Chitose City Purification Center into rivers	22,000	22,000	100	95,950	59,475	N/A	N/A	▪ Environmental conservation of rivers
Hachinohe City	Aomori	Mechanical works for renovating the screen sludge facilities at terminal sewerage treatment plants and settling basin equipment, etc.	1,305,130	653,530	50.07	150,690	17,942,633	15.0	N/A	▪ Annual electricity consumption 492,790kWh → 488,701kWh (Estimate)
Tsuruoka City(1)	Yamagata	Renovation and renewal of Tsuruoka Purification Center and one other facility	32,351	16,000	49.46	2,733	365,156	1.3	1.3	▪ Sludge recycling rate 100% (Composting, conversion to fuel) ▪ Securing sewerage treatment functions and lifelines in the event of disaster through the constructions enhancing earthquake-resistance and tsunami-resistance
Tsuruoka City(2)			387,245	184,400	47.62	74,569	10,116,268	2.1	0.9	▪ Sludge recycling rate 100% (Composting, conversion to fuel) ▪ Greenhouse cultivation using waste heat from power generation facilities (Heat supply: ~950,000MJ (A-heavy oil equivalent: ~26kL) ▪ Digestion gas power generation (Electricity for 400 households, CO_2 emission reduction: ~1,500t)
Iwaki City (1)	Fukushima	Renovation and renewal of aging treatment plants	442,073	198,900	44.99	178,800	25,877,770	15.0	0.62 →0.52	N/A
Iwaki City (2)			1,919,423	1,011,717	52.71					
Iwaki City (3)			902,726	567,730	62.89					
Hitachinaka City	Ibaraki	Renewal of electrical facilities at terminal treatment plants, etc.	189,078	90,000	47.60	100,783	7,410,245	1.5	2.59 →2.31	▪ Annual electricity consumption 2,469,801kWh → 2,459,176kWh
Utsunomiya City	Tochigi	Renewal of facilities operated beyond durable life	776,550	331,000	42.62	493,032	91,192,377	3.2 →1.75	1.55	▪ Improvement in living conditions through proper sewerage treatment ▪ Annual electricity consumption 19,310,107kWh → 19,014,469kWh ▪ Sludge recycling rate 100% (Delivery to recycling plants, composting companies and cement companies)

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

(iii) Project by Project Reporting: Sewerage Treatment Plant 3

Sewerage Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Maebashi City	Gunma	Renewal of Series 3 air diffusers at Maebashi Water Purification Center	49,580	49,580	100	66,616	17,616,493	4.0	1.1	N/A
Chiba City	Chiba	Execution design for renovating aging settling basin facilities and boiler facilities at Nanbu Purification Center of the Nanbu Treatment Area	25,985	14,459	55.64	N/A	N/A	N/A	N/A	▪ Securing stable treatment functions by reducing the risk of failure
Funabashi City	Chiba	Renewal of instrumentation facilities, rainwater settling basin facilities, and combined sewage pump electric facilities for Nishiura Sewerage Treatment Plant	921,680	414,600	44.98	110,700	19,843,116	2.9 →0.9	0.77 →0.6625	N/A
Tachikawa City	Tokyo	Renewal of aging ultrasonic wave level meters	13,805	13,800	99.96	97,341	18,000,000	1.8	1.36	▪ Sludge recycling rate 100% (Conversion to cement raw material) (Plan) ▪ Annual electricity consumption 7,520,362kWh → 7,500,000kWh (Plan)
Zushi City	Kanagawa	Renovation and renewal of the primary settling basin sludge collectors, etc. and instrumentation equipment (measures for longer useful life)	229,418	153,780	67.03	58,815	9,298,140	4.4	0.91	N/A
Toyama City	Toyama	Introduction of new facilities associated with the renewal of treatment plants	823,347	382,960	46.51	380,585	55,861,141	4.0	2.0 →1.0	▪ Reduction of electricity consumption by introducing new facilities ▪ Annual electricity consumption 14,004,069kWh → 13,999,740kWh ▪ Use of heat generated during sewerage treatment for the air conditioning facilities in Water and Sewer Bureau office building
Fukui City	Fukui	Renewal of mixing aeration equipment for Shimizu Seibu Environmental Center, and air conditioning facilities for Shimizu Tobu Environmental Center and Takasu Purification Center, etc.	194,868	106,848	54.83	230,791	57,406	3.1 →2.2	1.2	▪ Improvement in water quality ▪ Annual electricity consumption 714,778kWh → 675,310kWh
Nagano City (1)	Nagano	Construction of deodorization facilities	408,711	167,100	40.88	144,328	19,540,248	4.4	9.4 →6.3	▪ Annual electricity consumption 9,002,462kWh → 8,724,744kWh (Estimate)
Nagano City (2)		Construction of electrical facilities and water treatment facilities at Shinshu-Shinmachi Purification Center	29,000	13,500	46.55	1,437	147,362	1.9 →1.8	1.4	▪ Improvement in energy efficiency by developing energy-saving new facilities ▪ Annual electricity consumption 105,052kWh →103,163kWh (Estimate)
Matsumoto City	Nagano	Seismic reinforcement works for sludge treatment buildings (underground), chlorine mixing basin and discharge culvert at Ryoshima Purification Center	35,000	14,100	40.29	75,326	9,813,552	3.7 →2.5	0.6	▪ Securing stable sewerage treatment through the seismic reinforcement works ▪ Annual electricity consumption 3,776,928kWh → 3,611,664kWh (Estimate)

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

(iii) Project by Project Reporting: Sewerage Treatment Plant 4

Sewerage Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Gifu City(1)	Gifu	Renovation of mechanical equipment and electrical equipment at plants	97,160	92,300	95.00	377,800	44,760,891	6.4	0.6	▪ Annual electricity consumption 1,695,715kWh → 1,660,998kWh
Gifu City(2)			1,033,125	392,700	38.01					
Nabari City	Mie	Renewal of facilities and equipment, etc.	24,930	24,930	100	52,780	7,628,500	15.0	2.1	N/A
Uji City	Kyoto	Renewal of digestion tanks at sewerage treatment plants	419,544	197,000	46.96	63,420	6,775,399	5.4	1.2	▪ Annual electricity consumption 3,640,144kWh → 3,433,915kWh (Estimate)
Kishiwada City	Osaka	Renewal of rainwater pumping facilities and monitoring and control facilities, seismic reinforcing works for pump stations	566,939	271,400	47.87	1,779	2,462,930	3.3	0.4 →0.3	▪ Securing sufficient drainage capacity ▪ Reduction of CO_2 emissions by introducing energy-saving equipment ▪ Ensuring reliability as an essential lifeline for social activities and civic life through earthquake-resistant measures
Himeji City (1)	Hyogo	Renewal of aging sewerage treatment facilities	247,138	247,106	99.99	478,474	61,146,242	3.8	1.1 →1.0	▪ Annual electricity consumption 12,957,180kWh → 12,811,150kWh
Himeji City (2)			862,623	862,615	100					
Himeji City (3)			593,932	295,900	49.82					
Himeji City (4)			739,551	345,422	46.71					
Wakayama City(1)	Wakayama	Renovation of pump electrical facilities operated beyond durable life	93,000	42,200	45.38	20,696	7,020,300	5.6	0.32 →0.23	▪ Prevention of underground contamination due to leaking of sewage water at the time of natural disasters such as earthquake ▪ Annual electricity consumption 6,594,200kWh → 6,192,600kWh (Plan)
Wakayama City(2)			69,066	33,500	48.50					
Wakayama City(3)		Renovation of pump facilities operated beyond durable life	63,620	34,400	54.07					
Wakayama City(4)			75,000	34,100	45.47					
Wakayama City(5)		Replacement of power receiving and transforming facilities	36,930	33,600	90.98	83,998	15,078,000	3.6 →2.1	2.58	▪ Annual electricity consumption 6,275,360kWh → 6,000,480kWh (Plan)
Wakayama City(6)		Replacement of aging blower's ancillary facilities	6,994	6,400	91.51					
Kure City	Hiroshima	Renewal of monitoring and control facilities, etc.at purification centers	388,800	215,107	55.33	184,448	22,270,592	15.0	3.0	▪ Sludge recycling rate 100% (Composting, conversion to cement) ▪ Annual electricity consumption 17,285,748kWh → 16,605,514kWh

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

(iii) Project by Project Reporting: Sewerage Treatment Plant 5

Sewerage Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Tokushima City	Tokushima	Renewal of aging mechanical equipment and in-house power generation facilities at Chuo Purification Center and Hokubu Purification Center	223,027	102,372	45.90	79,184	18,660,523	8.92	1.2 →1.1	▪ Securing stable treatment functions in the event of disasters ▪ Annual electricity consumption 5,846,090kWh → 5,827,746kWh (Plan)
Takamatsu City	Kagawa	Renovation of aging facilities	415,348	198,300	47.74	293,420	34,806,674	2.6	0.67	▪ Recovery in functions, and reduction of CO_2 emissions by introducing energy-saving facilities ▪ Sludge recycling rate 100% (Conversion to cement, composting) ▪ Annual electricity consumption 15,653,847kWh → 15,193,906kWh (Plan)
Marugame City	Kagawa	Construction of a new purification center to replace the aging and non-earthquake resistant existing purification center	1,169,443	211,275	18.07	42,300	7,678,000	13.9	N/A	▪ Effectively use of treated water within treatment plants ▪ Reduction of CO_2 emissions by downsizing facilities and introducing energy-saving equipment
Imabari City	Ehime	Expansion of facilities at Onishi Water Treatment Center and Iguchi Purification Center to respond to the increase in treated water volume, and upgrade of facilities at Kuo agricultural community drainage treatment plant	281,688	129,760	46.07	8,801	1,096,792	1.91	2.07	N/A
Karatsu City	Saga	Renewal to facilities adopting solubilization devices	815,187	367,513	45.08	87,169	8,164,370	2.68	1.6895 →1.484	▪ Reduction of sludge by reducing moisture content of dehydrated sludge ▪ Increase in electricity output through the increase in gas generation ▪ Sludge recycling rate 100% (Composting)
Tosu City	Saga	Construction of additional water treatment facilities at Tosu City Purification Center	480,830	216,900	45.11	73,606	38,900	3.3	0.9	▪ Improvement of living conditions through appropriate sewerage treatment by expanding the treatment capacity
Miyazaki City(1)	Miyazaki	Renovation of aging air compressors and raw water pump facilities at Miyazaki Sewerage Treatment Plant	108,649	32,100	29.54	162,915	29,592,139	3.6	N/A	▪ Environmental improvement through stable sewerage treatment
Miyazaki City(2)		Partial renovation of No.2 and No.3 treated water pumps at Aoshima Purification Center	613,098	120,100	19.59	3,889	728,310	2.2		▪ Environmental improvement through stable sewerage treatment ▪ Annual electricity consumption 584,632kWh → 581,077kWh
Miyazaki City(3)		Partial renovation of No.5 main pump and No. 6 blower at Ohyodo Treatment Center	200,613	55,200	27.52	151,199	15,009,299	2.8		▪ Environmental improvement through stable sewerage treatment
Total Amount of Sewerage Treatment Plant (Renewal) (45 projects)			**18,474,007**	**9,056,504**						

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

(iii) Project by Project Reporting: Advanced Treatment Plant

Advanced Treatment Plant (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Toyohashi City	Aichi	Integration of sewage water treated at aging Noda Sewerage Treatment Plant into Nakajima Sewerage Treatment Plant	882,628	408,500	46.28	266,121	10,414,860	7.7 →7.0	0.16 →0.14	▪ Annual electricity consumption 11,558,414kWh → 11,521,886kWh
Total Amount of Advanced Treatment Plant (New) (1 project)			**882,628**	**408,500**						

Advanced Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Chiba City	Chiba	Renovation of the aging monitoring and control facilities at the advanced treatment plants at Nanbu Purification Center in the Nanbu treatment area	97,240	48,840	50.23	N/A	N/A	N/A	N/A	▪ Securing stable advanced treatment functions by reducing the risk of failure
Toyohashi City	Aichi	Reinforcement of building structure of treatment plants	12,434	6,782	54.54	266,121	10,414,860	7.7 →7.0	0.16 →0.14	▪ Improvement of seismic performance ▪ Annual electricity consumption 11,558,414kWh → 11,521,886kWh
Total Amount of Advanced Treatment Plant (Renewal) (2 projects)			**109,674**	**55,622**						

(iii) Project by Project Reporting: Sludge Treatment Plant 1

Sludge Treatment Plant (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Ichihara City	Chiba	Construction works related to the project of converting sludge into solid fuel at Matsugashima Terminal Treatment Plant	824,540	824,540	100	78,400	12,608,307	N/A	N/A	▪ Sludge recycling rate 100% (Conversion to solid fuel (Coal alternative) (Plan) ▪ Reduction of CO_2 emissions through the effective use of sewage sludge by converting into fuel
Nabari City	Mie	Promotion of a broader area management by centralizing the treatment of human waste/purification tank sludge at Central Purification Center due to aging of Iga-Nanbu Purification Center (human waste treatment plant)	446,470	202,700	45.40	52,780	7,628,500	N/A	N/A	N/A
Hatsukaichi City(1)	Hiroshima	Construction of new sludge treatment facilities (gravitational concentration) at Ohno Purification Center	17,000	8,500	50.00	14,320	1,297,180	N/A	N/A	▪ Improvement in public health, preservation of water quality in public waters ▪ Sludge recycling rate 100% (Composting) (Plan)
Hatsukaichi City(2)			259,000	158,900	61.35					
Hatsukaichi City(3)			74,000	32,000	43.24					
Hatsukaichi City(4)		Construction of new sludge treatment facilities (mechanical/gravitational concentration) at Hatsukaichi Purification Center	22,000	5,000	22.73	62,936	5,901,442			▪ Improvement in public health, preservation of water quality in public waters ▪ Sludge recycling rate 100% (Conversion to cement, composting) (Plan)
Total Amount of Sludge Treatment Plant (New) (6 projects)			**1,643,010**	**1,231,640**						

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

(iii) Project by Project Reporting: Sludge Treatment Plant 2

Sludge Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Hakodate City	Hokkaido	Renovation of No. 2 centrifugal dehydrator facilities and electrical facilities, etc. due to aging of facilities	430,610	328,800	76.36	111,600	130,308	N/A	N/A	▪ Sludge recycling rate 84.9% (Conversion to cement raw material and partial conversion to fertilizer) ▪ Reduction of CO_2 emissions by introducing energy-saving equipment ▪ Annual electricity consumption 1,749,588kWh → 1,681,820kWh
Asahikawa City	Hokkaido	Renovation and renewal of No. 1 sludge incinerator with bubble-type fluidized bed furnace due to aging of facilities and obsolescence in environmental performance	1,789,879	741,700	41.44	312,600	51,531,342	15.0	N/A	▪ Downsizing taking account of a future decrease in sludge volume (80t/day to 60t/day) and replacement with supercharged incinerators reducing CO_2 emissions and saving energies ▪ Annual electricity consumption 14,181,233kWh → 13,927,152kWh (Plan) ▪ Reduction of electricity consumption in the entire incineration system by using sludge incineration heat (~31.2%) ▪ CO_2 emitted during sludge incineration (Annual total) 15,979t → 8,235t (Plan) ▪ Sludge recycling (Conversion to cement (incineration ash)) ▪ Use of sewerage treatment water for snowmelt ▪ Use of digestion gas generated from sludge as auxiliary fuel for incineration
Miho Village	Ibaraki	Additional installation of oxidation ditch treatment systems	682,910	348,100	50.97	12,669	1,694,074	1.4 →0.95	3.5 →3.07	▪ Sludge recycling rate 100% (Composting) (Plan) ▪ Prevention of outbreak of mosquitoes, flies and infectious diseases, and improvement in the sanitary environment
Zushi City	Kanagawa	Renovation and renewal of concentrated sludge collectors (measures for longer useful life)	1,332,579	825,667	61.96	58,815	9,298,140	4.4	0.91	N/A
Toyama City	Toyama	Execution design for renovating sludge treatment facilities	33,755	15,189	45.00	22,893	3,189,600	N/A	N/A	▪ Sludge recycling rate 100% (Composting) ▪ Annual electricity consumption 1,636,500kWh → 1,633,920kWh
Tsubata Town	Ishikawa	Construction of energy-recovery waste treatment facilities for co-firing of general waste and sewage sludge	2,048,778	346,100	16.89	34,478	3,284,042	9.7	4.1 →2.3	▪ Annual electricity consumption 2,752,210kWh → 2,643,780kWh
Matsumoto City	Nagano	Renovation and renewal of No. 1 sludge dehydrator facilities and the power receiving and transforming facilities and seismic strengthening work for sludge treatment buildings at Miyabuchi Purification Center	177,760	63,500	35.72	125,481	21,125,688	N/A	N/A	▪ Stable sewerage treatment through the reconstruction and seismic retrofitting of aging facilities ▪ Sludge recycling rate 98.7% (Use of digestion gas for power generation and dehydrated cake as cement raw material) (Plan) ▪ Annual electricity consumption 3,090,695kWh → 2,602,464kWh (Estimate)

(iii) Project by Project Reporting: Sludge Treatment Plant 3

Sludge Treatment Plant (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Tokai City	Aichi	Renewal of dust removal facilities and sludge withdrawal valve facilities at purification centers	103,030	41,724	40.50	113,814	9,324,000	2.0	0.4	▪ Energy saving by adopting simplified systems ▪ Sludge recycling rate 5% (Conversion to cement, composting) ▪ Annual electricity consumption 4,064,000kWh → 3,658,000kWh (Plan)
Fukuchiyama City	Kyoto	Reconstruction of Sludge Treatment Facility	117,420	52,900	45.05	64,110	18,000,000	N/A	N/A	▪ Reduction of CO_2 emissions by shifting from sludge incineration to solid fuel conversion and introducing sludge digestion ▪ Annual electricity consumption 126,488kWh → 124,549kWh (Plan)
Wakayama City	Wakayama	Reconstruction of air preheaters operated beyond durable life	209,220	93,200	44.55	20,696	7,020,300	5.6	0.32 →0.23	▪ Annual electricity consumption 6,594,200kWh → 6,192,600kWh (Plan)
Iwakuni City	Yamaguchi	Renewal of aging sludge dehydrators at Ichimonji Terminal Treatment Plant	261,500	117,600	44.97	20,935	5,134,440	N/A	N/A	▪ Sludge recycling rate 100% (Composting)
Marugame City(1)	Kagawa	Construction of a new purification center to replace the aging and non-earthquake resistant existing purification center	1,169,443	211,275	18.07	42,300	N/A	N/A	N/A	▪ Reduction of CO_2 emissions by downsizing of facilities and introducing energy-saving equipment
Marugame City(2)			596,800	351,500	58.90					
Imabari City	Ehime	Renewal of sludge treatment equipment at Imabari Sewerage Treatment Center	506,962	204,480	40.33	83,020	13,442,950	N/A	N/A	▪ Reduction of annual sludge generation and electricity consumption by adopting dehydrators with lower moisture content and other advanced equipment ▪ Sludge recycling rate 38.09% (Composting, conversion to cement) (Plan) ▪ Annual electricity consumption 3,047,842kWh → 2,524,000kWh (Plan) ▪ Adoption of digestion gas power generation to consume the electricity produced by using gas generated during sludge treatment within the treatment facility (Power output = reduction amount 568,035kwh/year)
Total Amount of Sludge Treatment Plant (Renewal) (14 projects)			**9,460,646**	**3,741,735**						

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

(iii) Project by Project Reporting : Pump Station 1

Pump Station (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Iwaki City	Fukushima	Construction of rainwater pipes to reduce flood damage	284,832	136,370	47.88	N/A	N/A	N/A	N/A	N/A
Ichikawa City	Chiba	Construction of a new pump station to address the reorganization of the public sewerage (rainwater) drainage area	1,174,803	630,100	53.63	12,072	309,399,696	N/A	N/A	▪ Efficient removal of inland water in an area of about 70ha where urban functions and population are concentrated
Ichihara City	Chiba	Installation of manhole pumps to enable natural drainage	6,600	6,600	100	78,400	173,448	N/A	N/A	▪ Improvement of public health, creation of more comfortable living environment, and conservation of water quality in public waters such as rivers and ocean areas
Matsumoto City	Nagano	Construction of additional sewerage pumps to address the increasing sewage inflow into Nagisa Relay Pump Station	8,910	6,100	68.46	12,617	1,269,492	N/A	N/A	▪ Stable sewerage treatment
Toyohashi City	Aichi	Construction of a new manhole pump station to address the expanded drainage area	132,728	33,500	25.24	266,121	41,886,680	N/A	N/A	▪ Total length of sewer pipes newly constructed: 1,794m ▪ Annual volume of treated water to be increased by the construction of new sewer pipes is 458,528㎥ (Plan)
Matsusaka City	Mie	Construction of new inflow sewer pipes, machinery buildings, dust removal buildings, container buildings, machinery and electrical equipment for a rainwater pump station	1,785,396	310,900	17.41	N/A	1,175,040	N/A	N/A	▪ Enhancement of inland water removal to prevent flooding in urban areas
Higashi Osaka City	Osaka	Construction of a new pump station	1,515,033	24,949	1.65	474,777	88,898,952	N/A	N/A	▪ Upgrading of treatment capacity
Wakayama City (1)	Wakayama	Construction of a rainwater pump station	645,980	307,000	47.52	N/A	N/A	N/A	N/A	▪ Reduction of flood damage ▪ Prevention of discharge of untreated sewage into public waters due to heavy rain
Wakayama City (2)			47,125	21,400	45.41					
Tokushima City	Tokushima	Construction of new rainwater pumps at Showa Pump Station	189,750	96,660	50.94	79,184	10,141,209	N/A	N/A	▪ Stronger flood countermeasures to improve public health
Imabari City	Ehime	Construction of a wastewater relay pump station necessary to connect to the Imabari sewerage treatment area's eastern treatment system	423,420	196,020	46.29	2,064	1,087,700	N/A	N/A	▪ Total length of sewer pipes newly constructed: 46,461m
Kashima City	Saga	Construction of a rainwater pump station to reduce flood damage at the Minamifunatsu drainage area	338,190	156,495	46.27	12,916	1,062,064	N/A	N/A	▪ Prevention of discharge of untreated sewage into the ocean due to floods and heavy rain
Total Amount of Pump Station (New) (12 projects)			6,552,767	1,926,094						

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

(iii) Project by Project Reporting : Pump Station 2

Pump Station (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Hakodate City	Hokkaido	Renewal of No. 4 rainwater pump and electrical instrumentation at Ote Pump Station, private power generation facilities at Ugaura Relay Pump Station, and electrical instrumentation at Sumiyoshi Pump Station	476,849	269,100	56.43	15,100	4,912,632	N/A	N/A	▪ Replacement of devices with high-efficiency ones at Ote Pump Station to reduce power consumption ▪ Annual electricity consumption 691,203kWh → 613,008kWh
Hachinohe City	Aomori	Electrical and mechanical works for pumps at a wastewater relay pump station	185,380	81,100	43.75	N/A	N/A	N/A	N/A	N/A
Akita City	Akita	Renewal of equipment at an aging pump station	209,692	99,700	47.55	285,830	22,179,480	N/A	N/A	N/A
Maebashi City	Gunma	Renewal of sewage pumps at Iwagami Pump Station	10,120	10,120	100	2,680	278,830	N/A	N/A	N/A
Chiba City (1)	Chiba	Renovation of aging settling basin equipment at Hibino Pump Station in Imba Treatment Area	89,240	51,229	57.41	381,100	3,192,602	N/A	N/A	▪ Ensuring of stable sewerage treatment by reducing risks of malfunctions ▪ Annual electricity consumption 348,939kWh → 338,400kWh
Chiba City (2)		Renovation of aging private power generation facilities at Ochi Pump Station in Nanbu Treatment Area	110,000	56,957	51.78	N/A	N/A	N/A	N/A	▪ Ensuring of sewerage pumping capacity during power outage
Tachikawa City	Tokyo	Renewal of aging water pumps	11,965	11,700	97.79	38,754	689,000	N/A	N/A	▪ Annual electricity consumption 132,758kWh → 132,000kWh (Plan)
Zushi City	Kanagawa	Renewal of devices of aging remote monitoring system and renewal of devices of a damaged manhole pump	74,690	74,690	100	51,914	6,451,970	N/A	N/A	N/A
Toyama City	Toyama	Renewal of and seismic reinforcement works for aging equipment outside Iwase Wastewater Relay Pump Station	82,236	37,005	45.00	380,585	55,861,141	N/A	N/A	▪ Annual electricity consumption 1,065,132kWh → 1,027,052kWh
Fukui City (1)	Fukui	Renovation of aging Kamogawara Pump Station to satisfy earthquake-resistant standards and to improve drainage capacity against floods	3,687,340	1,628,182	44.16	230,791	57,406	N/A	N/A	N/A
Fukui City (2)		Renewal of aging equipment at a pump station	343,978	190,442	55.36					▪ Annual electricity consumption 4,435,596kWh → 4,208,371kWh
Matsumoto City	Nagano	Renovation and renewal of power receiving and transforming facilities at Nagisa Relay Pump Station	9,300	3,700	39.78	12,617	1,269,492	N/A	N/A	▪ Renovation of aging equipment to ensure stable sewage treatment ▪ Annual electricity consumption 94,296kWh → 81,036kWh (Estimate)

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

(iii) Project by Project Reporting : Pump Station 3

Pump Station (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Toyohashi City (1)	Aichi	Reinforcement of structure and steel frames of facilities in pump stations	65,073	31,720	48.75	266,121	4,190,760	N/A	N/A	▪ Improvement of seismic capacity
Toyohashi City (2)		Execution design to reinforce structure and steel frames of facilities in pump stations	42,734	23,307	54.54		1,091,901			▪ Improvement of seismic capacity ▪ Annual electricity consumption 321,860kWh → 318,594kWh
Okazaki City	Aichi	Renewal of aging motors at a rainwater pump station	675,000	327,500	48.52	N/A	N/A	N/A	N/A	N/A
Tokai City	Aichi	Renewal of pumps and water treatment equipment at Motohama Pump Station	874,619	394,976	45.16	5,391	4,760,000	N/A	N/A	▪ Ensuring of energy-saving benefits by adopting a simplified system ▪ Annual electricity consumption 129,900kWh → 116,900kWh (Plan)
Ise City	Mie	Renewal of equipment at a rainwater pump station	3,365,916	246,200	7.31	69,604	6,126,267	N/A	N/A	N/A
Fukuchi-yama City	Kyoto	Renovation and renewal of aging equipment	10,788	6,200	57.47	64,110	18,000,000	N/A	N/A	▪ Reduction of CO_2 emissions by adopting energy-saving equipment
Higashiosaka City	Osaka	Renewal of a pump station	1,515,033	40,272	2.66	474,777	88,898,952	N/A	N/A	▪ Improvement of earthquake resistance and treatment capacity ▪ Annual electricity consumption 630,427kWh → 566,965kWh
Kakogawa City	Hyogo	Renewal of aging mechanical and electrical equipment at a pump station	211,855	101,500	47.91	25,000	8,000,000	N/A	N/A	▪ Ensuring of energy-saving benefits by upgrading equipment ▪ Extension of durable life of mechanical and electrical equipment ▪ Annual electricity consumption 419,611kWh → 418,000kWh (Plan)
Wakayama City (1)	Wakayama	Renovation of rainwater pumps operated beyond its durable life	168,050	80,700	48.02	N/A	1,500,988	N/A	N/A	▪ Prevention of discharge of untreated sewage into public waters due to floods and heavy rain ▪ Annual electricity consumption 80,576kWh → 76,428kWh
Wakayama City (2)			171,733	78,000	45.42		10,132,080			▪ Annual electricity consumption 256,699kWh → 222,888kWh (Plan)
Wakayama City (3)		Renovation of direct-current power-supply equipment operated beyond its durable life at a rainwater pump station	21,682	10,400	47.97	N/A	3,499,440	N/A	N/A	N/A
Wakayama City (4)		Renovation of sewage pumps operated beyond their durable life	13,599	12,300	90.45	83,998	1,259,756	N/A	N/A	▪ Annual electricity consumption 125,350kWh → 115,620kWh

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

(iii) Project by Project Reporting : Pump Station 4

Pump Station (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Kure City	Hiroshima	Renewal of monitoring and control equipment at a pump station	367,818	188,331	51.20	184,448	22,270,592	15.0	3.0	▪ Sludge recycling rate 100% (composting and conversion to cement) ▪ Annual electricity consumption 17,285,748kWh → 16,605,514kWh
Hatsukaichi City (1)	Hiroshima	Expansion of a pump-related facility (the main pump) at Hatsukaichi Purification Center	11,000	2,500	22.73	59,258	5,556,560	N/A	N/A	▪ Improvement of public health, and conservation of water quality in public waters
Hatsukaichi City (2)		Renovation and renewal of manhole pumps	26,000	18,350	70.58	77,491	7,644,578	N/A	N/A	
Iwakuni City	Yamaguchi	Renovation of rainwater drainage facilities	552,482	189,600	34.32	8,803	792,000	N/A	N/A	▪ Reduction of flood damage
Tokushima City	Tokushima	Renewal of aging equipment at pump stations in the central and north purification centers	15,145	10,069	66.48	79,184	10,141,209	N/A	N/A	▪ Ensuring of stable treatment capacity to improve public health ▪ Annual electricity consumption 636,041kWh → 635,911kWh (Plan)
Takamatsu City	Kagawa	Renovation of aging facilities	91,128	44,800	49.16	N/A	36,667,716	N/A	N/A	▪ Reduction of CO_2 emissions by restoring functions and installing energy-saving equipment ▪ Annual electricity consumption 2,063,265kWh → 2,061,482kWh (Plan)
Marugame City	Kagawa	Renewal of equipment at pump stations	947,714	441,100	46.54	48,531	8,389,970	N/A	N/A	▪ Reduction of CO_2 emissions by installing energy-saving equipment ▪ Annual electricity consumption 1,374,661kWh → 1,247,885kWh
Imabari City	Ehime	Construction of additional rainwater pumps at Tenpozan Drainage Pump Station, and renewal of equipment at pump stations in the city	521,780	247,740	47.48	86,921	10,793,502	N/A	N/A	▪ Annual electricity consumption 1,581,470kWh → 1,492,886kWh
Kashima City	Saga	Renovation of Nakamuta Rainwater Pump Station (renewal of a pump and dust removal equipment)	348,386	174,193	50.00	12,619	1,037,668	N/A	N/A	▪ Mitigation of flood damage due to heavy rain in the city's central drainage area, and prevention of discharge of untreated sewage into the ocean due to floods and heavy rain ▪ Annual electricity consumption 19,580kWh → 17,784kWh (Plan)

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

(iii) Project by Project Reporting : Pump Station 5

Pump Station (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Covered Area Population (persons)	Annual Water Management Capacity (㎥)	Water Quality (BOD) (After treatment, Year/Period Average) (mg/L)	Water Quality (phosphorus) (After treatment, Year/Period Average) (mg/L)	Other positive environmental impact
Miyazaki City (1)	Miyazaki	(Miyazaki Treatment Area) Renovation of aging manhole pumps	20,540	6,600	32.13	162,915	29,592,139	N/A	N/A	▪ Stable sewerage treatment
Miyazaki City (2)		(Ohyodo Treatment Area) Renovation of aging manhole pumps	106,661	23,200	21.75	151,199	15,009,299			
Miyazaki City (3)		Renovation of power receiving and transforming facilities, private power generation facilities, operation equipment and instrumentation equipment at the relay pump station in Ohyodo Treatment Area	61,248	13,100	21.39		343,877			
Miyazaki City (4)		Renewal of aging devices of uninterruptible power systems at the relay pump station in Miyazaki Treatment Area	860	300	34.88	162,915	3,571,390			
Miyazaki City (5)		Renewal of a control panel's communication module at the manhole pump station in Sadowara Treatment Area	1,265	500	39.53	25,776	2,345,751			
Miyazaki City (6)		Renovation of an electric control panel at the manhole pump station in Aoshima Treatment Area under the time-based maintenance program	25,784	6,100	23.66	3,889	728,310			
Miyazaki City (7)		Partial renovation of sewage pumps at the relay pump station in Aoshima Treatment Area	8,616	3,400	39.46		678,020			▪ Stable sewerage treatment ▪ Annual electricity consumption 60,623kWh → 59,753kWh
Nobeoka City	Miyazaki	Renewal of pumps	601,666	300,900	50.01	85,894	12,785,437	2.6	1.7	▪ Stable treatment of rainwater and sewage ▪ Seismic reinforcement works to increase safety ▪ Sludge recycling rate 100% (composting)
Total Amount of Pump Stations (Renewal) (41 projects)			**16,134,965**	**5,537,783**						

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

(iii) Project by Project Reporting : Pipes 1

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population (persons)	Positive environment impact
Hakodate City	Hokkaido	Installation of sewer pipes in sewer undeveloped areas	217,543	155,800	71.62	162	28	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 3,204㎥ (Plan) ▪ Prevention of the discharge of raw sewage into seas
Asahikawa City	Hokkaido	Construction of rainwater pipes	580,993	381,299	65.63	290	74	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 18,926㎥ (Estimate)
Chitose City	Hokkaido	Switching from a junction system to a separate system with the new construction of waste water pipes, and the construction of sewer pipes in sewer undeveloped areas	116,900	116,900	100	1,098	11,890	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 6,925,306㎥ (Plan) ▪ Ensuring of a public health level and water quality in public waters
Hachinohe City	Aomori	Extension of pipe networks to reduce sewer uncovered areas	3,205,590	2,479,870	77.36	13,429	1,784	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 195,171㎥ ▪ Improvement of the living environment and conservation of water quality in rivers and estuarine waters
Morioka City	Iwate	Installation of waste water pipes and rainwater pipes	1,534,397	1,038,900	67.71	9,460	256,993	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 196,951.16㎥ ▪ Maintenance of a hygienic water environment and water quality in public waters
Sendai City	Miyagi	Development of a secure backup function of the trunk lines in the event of a disaster	158,454	79,227	50.00	2,873	755,108	▪ Maintenance of sewer drainage functions in the event of a disaster
Akita City	Akita	Installation of waste water pipes in sewer uncovered areas, the installation of rainwater pipes for flood control, and the installation of connection pipes for the consolidation or closure of treatment facilities	1,213,563	741,300	61.08	6,647	2,656	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 222,284m^3 ▪ Conservation of water quality, improvement of living environment, and flood control ▪ Reduction of the use of chemicals and electricity by improving the efficiency of wastewater treatment and utilizing economies of scale
Tsuruoka City(1)	Yamagata	New construction of waste water pipes for public sewers	186,233	155,300	83.39	1,762	74,600	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 58,475.52㎥ (Plan) ▪ Conservation of water quality in public waters and improvement of living environment
Tsuruoka City(2)			613,039	417,000	68.02	7,898	75,280	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 89,672.83㎥ (Plan) ▪ Conservation of water quality in public waters and improvement of living environment
Tsuruoka City(3)		New construction of rainwater pipes for public sewers	217,000	130,700	60.23	356	N/A	▪ Prevention and mitigation of flood damage by the installation of rainwater culverts
Tsuruoka City(4)			181,593	97,200	53.53	410	N/A	

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

(iii) Project by Project Reporting : Pipes 2

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population (persons)	Positive environment impact
Iwaki City(1)	Fukushima	Installation of rainwater pipes to mitigate flood damage	55,000	24,800	45.09	N/A	N/A	N/A
Iwaki City(2)			60,059	49,425	82.29	346		
Iwaki City(3)		Installation of waste water pipes in sewer undeveloped areas	107,474	89,758	83.52	558	178,800	
Iwaki City(4)			288,085	259,000	89.90	501		
Hitachinaka City	Ibaraki	Installation of waste water pipes (for uncovered areas) and rainwater pipes (as flood control measures)	1,903,769	1,125,900	59.14	3,883	100,783	▪ Maintenance of water quality in public waters ▪ Mitigation of flood damage
Miho Village	Ibaraki	New construction of pipes	682,910	348,100	50.97	706	12,669	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 66,137㎥
Utsunomiya City	Tochigi	New construction of sewer pipes in sewer uncovered areas	223,127	195,400	87.57	4,621	493,032	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 2,816,525㎥ ▪ Improvement of living environment by proper treatment of sewage
Maebashi City	Gunma	New construction of sewer trunk lines and branch pipes	668,761	668,761	100	3,781	237,087	▪ Conservation of water quality in public waters
Takasaki City	Gunma	Construction of waste water pipes and rainwater pipes in uncovered areas	1,653,225	729,500	44.13	13,935	284,171	▪ With the increase in the total length of sewer pipes, the area where sewage systems are available will expand by approx. 85ha
Yashio City(1)	Saitama	Construction of sewer pipes to drain into public sewerage systems and rainwater pipes to drain rainwater	273,274	94,600	34.62	6,734	73,988	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 74,645㎥ (Estimate)
Yashio City(2)			2,482,293	1,308,100	52.70			
Ichikawa City(1)	Chiba	New construction of waste water pipes in uncovered areas	4,503,247	2,438,800	54.16	14,557	4,694	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 625,358㎥ ▪ Improvement of water quality in public waters, by switching from independent septic tanks, which have a large environmental impact, to public sewerage systems
Ichikawa City(2)		New construction of rainwater pipes in undeveloped areas	1,095,034	618,100	56.45	386	N/A	▪ Mitigation of flood damages on houses/buildings in the densely populated areas
Funabashi City	Chiba	Construction of pipes integrally with other facilities	4,172,645	2,574,400	61.70	11,174	600,729	▪ Improvement of water quality
Matsudo City	Chiba	Installation of sewer pipes	1,630,540	996,400	61.11	10,279	439,612	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 500,000㎥ (Plan) ▪ Improvement of environmental hygiene through the expansion of sewerage systems

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

(iii) Project by Project Reporting : Pipes 3

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population (persons)	Positive environment impact
Narashino City(1)	Chiba	Construction of rainwater discharge trunk lines	824,000	412,000	50.00	N/A	N/A	▪ Mitigation of environmental impact by reducing the discharge of raw sewage from junction pipes into public waters during heavy rains
Narashino City(2)			1,487,900	743,900	50.00			
Narashino City(3)		Construction of sewerage facilities (sewer pipes, public sewage basins, mounting pipes, etc.)	131,298	93,500	71.21	325	23	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 3,316㎥ (Plan) ▪ Mitigation of the impact on the surrounding environment by properly treating sewage
Narashino City(4)			10,857	10,800	99.47	N/A	6	▪ Mitigation of the impact on the surrounding environment by properly treating sewage
Kashiwa City	Chiba	Construction of separate sewer systems in uncovered areas	1,593,323	1,140,400	71.57	6,816.12	393,779	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 295,546.96㎥ (Plan) ▪ Mitigation of the burden on the surrounding environment including Lake Teganuma (to widen the area coverage of sewage treatment by 20.36ha)
Ichihara City(1)	Chiba	Construction of sewer pipes in the Kitagoi Area(for sewage and rainwater drainage)	26,299	11,290	42.93	175.2	19	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 4,096㎥ (Plan) ▪ Improvement of public health, conservation of water quality in public waters, and mitigation of flood damage
Ichihara City(2)		Construction of waste water pipes (Kitaaoyagi Area)	113,817	53,070	46.63	388.5	46	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 10,156㎥ (Plan) ▪ Improvement of public health, and conservation of water quality in public waters
Ichihara City(3)		Construction of waste water pipes (Furuichiba Area)	111,647	76,620	68.63	731.2	144	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 31,898㎥ (Plan) ▪ Improvement of public health, and conservation of water quality in public waters
Ichihara City(4)		Construction of waste water mounting pipes in Ichihara District	1,725	1,350	78.26	N/A	5	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 1,007㎥ (Plan) ▪ Improvement of public health, and conservation of water quality in public waters
Odawara City(1)	Kanagawa	New construction of waste water pipes	204,826	134,285	65.56	637	156,534	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 4,902㎥ (Plan) ▪ Prevention of inflow of domestic wastewater into rivers
Odawara City(2)			231,641	201,687	87.07	836	156,628	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 12,900㎥ (Plan) ▪ Prevention of inflow of domestic wastewater into rivers
Odawara City(3)		New construction of rainwater pipes	137,291	77,622	56.54	158	N/A	▪ Mitigation of the risk of flood damage
Odawara City(4)			70,308	54,493	77.51	117		

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

(iii) Project by Project Reporting : Pipes 4

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population (persons)	Positive environment impact
Zushi City	Kanagawa	Construction of manhole toilet systems in evacuation centers, development of rainwater pipes and other facilities, and development of bypass pipes between existing manholes	100,073	79,217	79.16	726	3,550	N/A
Samukawa Town	Kanagawa	Installation of waste water and rainwater pipes for public sewerage systems	66,591	43,497	65.32	28	45,865	▪ Improvement of water quality in public waters and mitigation of rainwater inundation
Toyama City	Toyama	New construction of pipes	1,112,610	741,359	66.63	2,652	380,585	▪ Improvement of water quality by controlling the inflow of untreated waste water into rivers, etc.
Fukui City	Fukui	Construction of pipes in uncovered areas	3,166,067	2,527,972	79.85	27,431	230,791	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 739,476.9㎥ (Plan) ▪ Improvement of water quality in public waters
Nagano City	Nagano	New construction of rainwater pipes	1,168,890	594,500	50.86	820	145,098	▪ Prevention of discharge of raw sewage into rivers due to inundation and heavy rains
Matsumoto City(1)	Nagano	New construction of Chikuma waste water trunk lines, concurrently with road improvement work	9,593	6,100	63.59	40	125,481	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 21,125,688㎥ (Estimate)
Matsumoto City(2)			43,160	4,700	10.89			
Gifu City(1)	Gifu	Construction of drainage	61,480	39,400	64.09	274	N/A	N/A
Gifu City(2)			258,797	159,400	61.59			
Fuji City	Shizuoka	New construction of pipes	1,018,500	779,900	76.57	5,912	N/A	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 10,934㎥
Toyohashi City	Aichi	Installation of rainwater pipes	393,847	197,940	50.26	262	266,121	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 2,615,842㎥ (Plan) ▪ Mitigation of flood damage
Okazaki City	Aichi	New construction of sewer pipes	735,970	410,574	55.79	8,956	342,884	N/A
Hekinan City	Aichi	Installation of sewer systems in uncovered areas	1,641,053	877,400	53.47	9,134	63,960	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 72,090㎥
Yokkaichi City	Mie	New construction of sewer pipes in uncovered areas	5,751,813	3,346,000	58.17	10,760	251,666	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 480,741㎥
Ise City	Mie	New construction of sewer pipes as part of a regional sewerage development project	3,365,916	1,551,200	46.09	9,736	69,604	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 59,743㎥ ▪ Conservation of water quality in public waters
Matsusaka City(1)	Mie	Installation of waste water pipes	1,785,396	726,500	40.69	9,158	82	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 948㎥ (Plan)
Matsusaka City(2)		Installation of rainwater pipes		88,700	4.97	491	N/A	▪ Mitigation of flood damage

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

(iii) Project by Project Reporting : Pipes 5

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population (persons)	Positive environment impact
Nabari City	Mie	Construction of sewerage ducts in uncovered areas of the northern part of the city	375,035	237,200	63.25	2,929	52,780	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 2,000㎥ (Plan)
Fukuchiyama City	Kyoto	Rehabilitation of drainage canals in areas where flood control measures have not been implemented	62,981	18,200	28.90	94	64,110	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 18,000,000㎥ (Plan)
Uji City	Kyoto	Installation of pipes	184,525	136,400	73.92	1,536	177,572	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 95,351.14㎥ (Estimate) ▪ Improvement of living environment by improving water quality in public waters
Kishiwada City(1)	Osaka	New construction of sewer pipes	3,728	3,500	93.88	30	20	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 860㎥ (Plan)
Kishiwada City(2)		New construction of rainwater pipes	8,540	8,100	94.85	57	8	N/A
Higashiosaka City	Osaka	New construction of pipes	1,515,033	387,656	25.59	3	474,777	▪ Improvement of treatment capacity
Himeji City(1)	Hyogo	New construction of pipes	374,205	374,194	100	2,801	478,474	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 59,076㎥
Himeji City(2)			610,646	610,585	99.99			
Himeji City(3)			1,203,000	601,500	50.00			
Himeji City(4)			298,493	150,678	50.48			
Kakogawa City	Hyogo	New construction of sewer pipes in sewer undeveloped areas	1,577,092	1,241,800	78.74	3,676	192	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 54,533㎥ (Plan) ▪ Improvement of public health and living environment
Wakayama City(1)	Wakayama	New construction of sewer pipes (to increase sewerage penetration rates and prevent floods	1,521,178	859,600	56.51	5,761.9	137,126	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 192,402.5㎥ (Plan) ▪ Improvement of public water environment
Wakayama City(2)			76,230	62,000	81.33	N/A		▪ Improvement of public water environment
Kure City	Hiroshima	Installation of sewer pipes in sewer undeveloped areas	528,090	435,755	82.52	7,263	184,448	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 11,015㎥ ▪ Improvement of living environments
Fukuyama City(1)	Hiroshima	New construction of pipes	562,313	393,000	69.89	6,544	350,209	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 253,044㎥
Fukuyama City(2)			532,623	374,500	70.31	6,198		▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 240,232㎥

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

(iii) Project by Project Reporting : Pipes 6

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population (persons)	Positive environment impact
Hatsukaichi City(1)	Hiroshima	Installation of pipes	1,470,031	950,600	64.67	7,033	77,491	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 175,698㎥ (Plan) ▪ Improvement of public health and conservation of water quality in public waters
Hatsukaichi City(2)			18,106	4,100	22.64			
Hatsukaichi City(3)			499,226	301,400	60.37	3,991		
Hatsukaichi City(4)			15,793	15,700	99.41			
Iwakuni City	Yamaguchi	New construction of waste water pipes for public sewerage systems	19,346,046	742,300	3.84	5,005	N/A	N/A
Tokushima City	Tokushima	Construction of sewer pipes, restoration of pavement, etc.	858,872	621,937	72.41	3,933	79,184	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 205,855㎥ (Plan) ▪ Improvement of water quality by proper treatment of sewage
Marugame City	Kagawa	New construction of waste water pipes	1,169,443	140,850	12.04	1,084	48,531	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 160,150㎥ ▪ Creation of a comfortable living environment through water quality conservation in public waters
Imabari City	Ehime	Installation of sewer pipes in uncovered areas	612,172	375,990	61.42	6,264	80,438	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 68,111㎥ (Plan)
Niihama City	Ehime	Installation of pipes	938,228	564,100	60.12	3,751	74,261	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 59,547㎥ (Plan)
Karatsu City	Saga	Installation of pipes	239,700	239,700	100	2,039	87,169	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 47.8㎥ ▪ Mitigation of domestic wastewater discharge to waterways
Kashima City	Saga	Construction and paving of waste water semi-trunk lines and branch lines, and the installation of rain drainage systems in Minamifunatsu Area	479,629	252,841	52.72	2,098	12,619	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 24,396㎥ (Plan) (the service area will be newly extended by 4.16ha) ▪ Conservation of water quality and improvement of living environment in public waters by sewage treatment ▪ Mitigation of flood damage
Nagasaki City(1)	Nagasaki	Installation of rainwater storage pipes and rainwater pipes and the installation of waste water pipes under public/private roads	916,224	583,900	63.73	N/A	N/A	N/A
Nagasaki City(2)			472,109	310,474	65.76	212		▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 6,844㎥

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

(iii) Project by Project Reporting : Pipes 7

Pipes (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Newly constructed pipe length (m)	Covered Area Population (persons)	Positive environment impact
Miyazaki City(1)	Miyazaki	New construction of rainwater pipes	374,466	91,500	24.43	978	364,269	N/A
Miyazaki City(2)		New construction of waste water pipes(Miyazaki Area)	304,359,441	105,700	0.03	738.4	162,915	▪ Conservation of water quality in public waters
Miyazaki City(3)		New construction of waste water pipes (Sadowara Area)	3,355	1,000	29.81	26	25,776	
Miyazaki City(4)		New construction of waste water pipes (Aoshima Area)	8,075	1,900	23.53	98.5	3,889	
Miyazaki City(5)		New construction of waste water pipes (Ohyodo Area)	19,411	3,200	16.49	N/A	151,199	
Miyazaki City(6)		New construction waste water pipes (Tano Area)	963	400	41.54	N/A	7,141	
Miyazaki City(7)		New construction of waste water pipes (Kibana Area)	10,622	2,500	23.54	109.4	13,349	
Miyazaki City(8)		New construction of waste water pipes	9,869	3,948	40.00	738.4	162,915	
Kagoshima City	Kagoshima	New construction of sewerage duct facilities	2,115,862	1,355,000	64.04	4,860	468,400	▪ Annual volume of treated water to be increased by the new construction of sewer pipes is 83,271.7㎥
Total Amount of Pipes (New) (94 projects)			396,337,881	44,715,524				

※ Total Project Cost and JFM Loan Amount that overlap with other projects are excluded from the Total Amount
※ Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several JFM loan projects in one borrowing entity

(iii) Project by Project Reporting : Pipes 8

Pipes (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Annual Water Treated (m^3)	Positive environment impact
Hakodate City	Hokkaido	Renewal of aging pipes	817,233	637,200	77.97	25,631	▪ Prevention of sewage runoff from contaminating the ground during earthquakes and other natural disasters
Asahikawa City	Hokkaido	Renewal of waste water pipes	164,017	159,401	97.19	52,925	▪ Prevention of serious accidents/malfunctions due to aging of sewerage facilities.(the area subject to this renewal project covers approx. 1.8km)
Chitose City	Hokkaido	Rehabilitation of deteriorated waste water pipes	804,400	804,400	100	599,330	N/A
Hachinohe City	Aomori	Reconstruction of pipes	146,917	110,400	75.14	17,942,633	N/A
Morioka City	Iwate	Rehabilitation of aging pipes	348,705	200,800	57.58	40,172,415	▪ Maintenance of sanitary water environments through the conservation of water quality in public waters
Akita City	Akita	Renovation of aging pipes and renewal of manhole pump facilities	1,516,346	814,400	53.71	34,404,630	▪ Seismic strengthening and life extension of sewer pipes ▪ Reduction of the use of chemicals and electricity at treatment plants by reducing water intrusion during rainy weather
Tsuruoka City(1)	Yamagata	Renewal and upgrading of sewer pipe facilities	72,815	41,700	52.27	13,505,000	▪ Conservation of water quality in public waters and maintenance of living environment
Tsuruoka City(2)			29,718	15,700	52.83		
Utsunomiya City	Tochigi	Rehabilitation of aging pipes and seismic strengthening of existing pipes	514,658	471,800	91.67	91,192,377	▪ Ensuring of appropriate sewage treatment even during a disaster
Maebashi City	Gunma	A project to renovate or upgrade pipes including the maintenance of rainwater trunk lines in re-zoning areas	337,439	337,439	100	38,725,002	▪ Extension of the durable life of pipes
Chiba City(1)	Chiba	Reconstruction and seismic retrofitting of aging pipes	118,371	118,371	100	N/A	▪ Prevention of underground contamination due to sewage runoff from broken pipes during earthquakes and other natural disasters
Chiba City(2)			959,516	550,744	57.40		
Ichikawa City	Chiba	Reconstruction and renewal of aging sewerage facilities	22,690	17,900	78.89	N/A	▪ Improvement of public health and maintenance of water quality in public waters
Funabashi City	Chiba	Refurbishment and repair of existing facilities to prevent road cave-ins due to the deterioration	446,276	393,500	88.17	N/A	▪ Soil pollution control ▪ Extension of the durable life of facilities
Narashino City	Chiba	Reconstruction with internal rehabilitation of waste water pipes	43,668	43,600	99.84	N/A	▪ Mitigation of environmental burden by preventing water outflow into the surrounding environment
Tachikawa City(1)	Tokyo	Renewal of pipes (for flood control)	163,460	103,700	63.44	66,635,568	N/A
Tachikawa City(2)		Development of facilities required for water supply from Nishikicho Sewage Treatment Plant to Kitatama No. 2 Water Recycling Center	1,337,800	599,700	44.83	17,187,850	▪ Improvement of water environment with the introduction of advanced treatment technologies

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

(iii) Project by Project Reporting : Pipes 9

Pipes (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Annual Water Treated (m^3)	Positive environment impact
Odawara City(1)	Kanagawa	Seismic retrofitting of waste water pipes	285,471	145,757	51.06	27,900,467	▪ Prevention of sewage runoff from contaminating the ground during earthquakes and other natural disasters by renewal of aging pipes
Odawara City(2)			343,754	238,308	69.33		
Odawara City(3)		Extension of the durable life of waste water pipes	79,321	32,036	40.39		
Odawara City(4)			159,458	110,112	69.05		
Zushi City	Kanagawa	Rehabilitation of sewerage duct facilities as measures to extend durable life	29,055	23,055	79.35	N/A	N/A
Samukawa Town (1)	Kanagawa	Renewal of aging manhole covers	55,323	32,023	57.88	5,582,446	▪ Conservation of discharged water quality in public waters by reducing the inflow of rainwater through replacement with iron covers
Samukawa Town (2)			841	841	100		
Toyama City	Toyama	Renewal of aging sewer pipe facilities	974,095	583,482	59.90	55,861,141	▪ Maintenance of stable sewage treatment functions
Fukui City	Fukui	A project to rehabilitate and reconstruct pipes to address aging pipes	1,046,463	602,800	57.60	57,406,000	N/A
Nagano City(1)	Nagano	Renewal of aging waste water pipes	433,438	382,600	88.27	42,128,000	▪ Prevention of sewage runoff from contaminating the ground during earthquakes and other natural disasters
Nagano City(2)		Execution design for renewal of failure reporting equipment at manhole pump stations, etc.	2,970	1,300	43.77	N/A	▪ Energy conservation through the installation of new equipment/facilities
Nagano City(3)		Renewal of manhole pump facilities in Hirashigaki District	26,004	11,700	44.99		
Matsumoto City(1)	Nagano	Upgrading of pipes and earthquake-resistance measures for sewerage duct facilities	388,688	247,200	63.60	21,125,688	▪ Stable sewage treatment during earthquakes and other natural disasters
Matsumoto City(2)			645,930	551,000	85.30		
Gifu City(1)	Gifu	Reconstruction of sewer pipes	269,604	256,100	94.99	56,036,281	N/A
Gifu City(2)			244,958	80,100	32.70		
Toyohashi City(1)	Aichi	Rehabilitation of aging pipes	1,214,556	667,858	54.99	41,886,680	N/A
Toyohashi City(2)			711,583	355,793	50.00		
Okazaki City	Aichi	Renewal of waste water pipes and junction pipes	1,080,430	543,126	50.27	N/A	N/A

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

(iii) Project by Project Reporting : Pipes 10

Pipes (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Annual Water Treated (m^3)	Positive environment impact
Ise City	Mie	Renewal of sewerage manhole pump equipment and rainwater pipes	3,365,916	34,700	1.03	6,126,267	N/A
Nabari City	Mie	Renewal of pipes	107,949	59,000	54.66	7,628,500	N/A
Fukuchiyama City	Kyoto	Renovation of manhole iron covers based on the remaining durable life of each cover, seismic strengthening of pipes, etc.	304,771	172,250	56.52	18,000,000	N/A
Uji City	Kyoto	Renewal of pipes	82,090	53,300	64.93	N/A	▪ Enhancement of living environment by improving water quality in the entire public waters
Kishiwada City(1)	Osaka	Installation of new pipes for flood control	14,527	4,400	30.29	18,000	N/A
Kishiwada City(2)		Replacement of mounting pipes to prevent rainwater and groundwater from entering sewer pipes	16,760	5,200	31.03	16,000	
Higashiosaka City (1)	Osaka	Renewal of pipes	1,515,033	662,923	43.76	88,898,952	▪ Strengthening of earthquake resistance and treatment capacity
Higashiosaka City (2)			363,143	283,100	77.96		
Wakayama City(1)	Wakayama	Rehabilitation and renewal of end-of-life pipes	134,727	66,500	49.36	15,414	N/A
Wakayama City(2)			23,156	21,000	90.69	768	
Kure City	Hiroshima	Renewal of aging pipes	506,384	232,651	45.94	22,270,592	▪ Prevention of sewage inflow into the ground due to pipe breakage during natural disasters
Fukuyama City(1)	Hiroshima	Renewal of pipes	124,874	62,437	50.00	37,593,017	N/A
Fukuyama City(2)			869,790	514,055	59.10		
Tokushima City	Tokushima	Reconstruction of aging pipes, etc.	540,926	314,374	58.12	18,660,523	▪ Prevention of soil contamination due to sewage outflow from aging pipes
Imabari City	Ehime	Replacement and rehabilitation of pipes	329,928	254,270	77.07	14,387,682	N/A
Tosu City	Saga	Construction of rainwater pipes	138,771	72,910	52.54	8	▪ Mitigation of flood damage by heavy rains
Kashima City	Saga	Renewal of manhole covers	4,293	2,500	58.23	1,037,668	▪ Conservation of water quality in public waters by reducing rainwater infiltration into waste water pipes
Miyazaki City	Miyazaki	Renewal and seismic retrofitting of aging pipes	1,405,137	314,200	22.36	29,592,139	▪ Prevention of sewage flowing into the ground during earthquakes and other natural disasters
Total Amount of Pipes (Renewal) (54 projects)			25,684,146	13,415,716			

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

(iii) Project by Project Reporting: Others 1

Others (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Positive environmental impact
Morioka City	Iwate	Contribution for construction of regional sewerage systems	110,703	109,000	98.46	N/A
Utsunomiya City	Tochigi	Contribution for project of regional sewerage systems	43,221	43,200	99.95	N/A
Chiba City	Chiba	Construction of rainwater storage tanks, etc.	270,000	165,000	61.11	▪ Reduction of flood damage
Funabashi City	Chiba	Contribution for construction of regional sewerage systems	541,497	467,300	86.30	N/A
Narashino City (1)	Chiba	Contribution for construction of Lake Inbanuma regional sewerage system project	34,802	34,800	99.99	N/A
Narashino City (2)		Cost for outsourcing execution design to construct junction pipes, and compensation to relocate obstacles before construction of rainwater pipes	215,314	214,100	99.44	
Narashino City (3)		Cost for execution design to construct junction pipes, and compensation to relocate obstacles before construction of sewerage pipes	16,576	11,500	69.38	
Kashiwa City	Chiba	Contribution for regional sewerage systems	211,941	178,900	84.41	N/A
Ichihara City (1)	Chiba	Contribution for outsourcing execution design to construct the prefecture's water pipes that are temporarily diverted due to interference caused by sewer construction	4,235	4,020	94.92	N/A
Ichihara City (2)		Contribution for construction of the prefecture's water pipes that are temporarily diverted due to interference caused by sewer construction (Furuichiba Area)	4,002	3,800	94.95	
Ichihara City (3)		Contribution for construction of the prefecture's water pipes that are temporarily diverted due to interference caused by sewer construction (Ichihara Area)	6,706	6,370	94.99	
Ichihara City (4)		Final restoration of pavement after construction of sewer pipes (Goi Station East Exit Area)	677	640	94.53	▪ Repair of bumpy road surface to reduce noise and vibration, ensuring safe and comfortable living environment for citizens
Ichihara City (5)		Final restoration of pavement after construction of sewer pipes (Kita Aoyagi Area)	608	490	80.59	
Ichihara City (6)		Final restoration of pavement after construction of sewer pipes (Furuichiba Area)	4,918	3,380	68.73	
Ichihara City (7)		Final restoration of pavement after construction of sewer pipes (Ohmaya Area)	12,547	6,720	53.56	
Ichihara City (8)		Execution design necessary to construct sewerage pipes (Furuichiba Area)	8,594	5,280	61.44	N/A
Ichihara City (9)		Execution design necessary to construct sewerage pipes (Wakamiya Area)	3,721	3,530	94.87	

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

(iii) Project by Project Reporting: Others 2

Others (New)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Positive environmental impact
Tachikawa City (1)	Tokyo	Construction of facilities for sending sewage from Nishikicho Sewerage Treatment Plant to Kitatama No. 2 Water Reclamation Center	51,000	22,900	44.90	▪ Advanced wastewater treatment to improve the water environment
Tachikawa City (2)			1,082,920	486,400	44.92	
Kawasaki City	Kanagawa	Construction of two or more facilities including those for sewerage treatment / advanced treatment / sludge treatment, and pump stations, sewer pipes, etc.	20,759,525	772,000	3.72	N/A
Hiratsuka City	Kanagawa	Construction of and seismic reinforcement works on sewerage ducts, and works on pump stations for earthquake resistance and longer durable life	1,604,621	1,192,400	74.31	N/A
Samukawa Town (1)	Kanagawa	Contribution for construction of regional sewerage pipes, rainwater culverts and retention ponds associated with the land rearrangement project	748,080	748,064	100	▪ Improvement of water quality and reduction of rain flood in public waters by replacing vault toilets and single septic tanks with the public sewerage system
Samukawa Town (2)		Outsourcing of execution design for sluice pipes to improve rivers	5,225	5,225	100	N/A
Matsumoto City	Nagano	Construction of rainwater pipes	107,660	28,000	26.01	▪ Reduction of discharge of untreated sewage into rivers due to heavy rain
Ise City	Mie	Contribution for construction of regional sewerage systems	141,495	141,300	99.86	N/A
Uji City (1)	Kyoto	Administrative / labor costs and contribution for regional sewerage systems to construct new sewer pipes	128,982	128,600	99.70	N/A
Uji City (2)		Costs to design and construct rainwater storage facilities	491,759	284,400	57.83	N/A
Kishiwada City	Osaka	Replacement of manhole pump control panels and reporting devices that reach their durable life	21,494	20,200	93.98	N/A
Kure City	Hiroshima	Purchase of fixed assets, design work, and commissioning of real property registration	79,891	39,497	49.44	N/A
Fukuyama City (1)	Hiroshima	Projects related to rainwater facilities	1,939,409	1,216,910	62.75	N/A
Fukuyama City (2)			1,718,682	849,431	49.42	
Hatsukaichi City	Hiroshima	Construction of additional pumps at and improvement of seismic capacity of Ohgi Pump Station	14,900	7,400	49.66	▪ Prevention of floods
Nagasaki City (1)	Nagasaki	Construction of a new city hall	74,309	70,500	94.87	N/A
Nagasaki City (2)			284,998	270,700	94.98	
Total Amount of Others (New) (34 projects)			30,745,012	7,541,957		

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

(iii) Project by Project Reporting: Others 3

Others (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Positive environmental impact
Hakodate City	Hokkaido	Renewal of facilities including those for sewerage and sludge treatment and sewer pipes (contribution for project of regional sewerage systems)	63,862	60,800	95.21	N/A
Hachinohe City	Aomori	Contribution for construction of regional sewerage systems (renewal of power receiving & transforming facility in the treatment plant's control building, and renovation of sewerage duct facilities)	21,600	20,700	95.83	N/A
Akita City (1)	Akita	Contribution for construction of regional sewerage systems	321,705	304,300	94.59	N/A
Akita City (2)		Renewal of the treatment plant's fire equipment, and outsourcing of execution design to construct a new pump station	32,678	17,800	54.47	N/A
Hitachinaka City	Ibaraki	Contribution for construction of regional sewerage systems (contributions to renovate electrical and mechanical equipment in Naka Kuji Purification Center)	35,407	31,700	89.53	N/A
Takasaki City	Gunma	Improvement of sewerage treatment facilities and equipment, and contribution for regional sewerage systems	344,327	277,200	80.50	▪ Prevention of serious accidents to be caused by aging of sewerage facilities
Hiratsuka City	Kanagawa	Construction of and seismic reinforcement works on sewerage ducts, and works on pump stations for earthquake resistance and longer durable life	14,091	13,700	97.23	N/A
Zushi City	Kanagawa	Renovation of shutters at settling basin building	29,055	23,055	79.35	N/A
Samukawa Town	Kanagawa	Outsourcing of development of plans to renovate aging manhole covers	10,450	6,350	60.77	N/A
Fukui City (1)	Fukui	Contribution for construction of regional sewerage systems	23,100	23,100	100	N/A
Fukui City (2)		Improvement of facilities to prevent floods	24,168	23,454	97.05	N/A
Nagano City	Nagano	Contribution for construction of regional sewerage systems	540,750	540,600	99.97	N/A
Matsumoto City	Nagano	Contribution for regional sewerage systems	650	600	92.31	N/A
Fukuchiyama City	Kyoto	Seismic diagnosis of sewerage facilities, and execution design to renovate and renew aging facilities	283,797	144,650	50.97	N/A
Uji City (1)	Kyoto	Administrative / labor costs for renewal of a sewerage treatment plant	6,060	6,000	99.01	N/A
Uji City (2)		Design of facilities for advanced treatment	10,500	5,200	49.52	N/A
Kishiwada City	Osaka	Outsourcing fees related to regional sewerage sludge treatment	5,673	5,100	89.90	N/A

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

(iii) Project by Project Reporting: Others 4

Others (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Positive environmental impact
Higashi Osaka City	Osaka	Renewal of facilities related to Neya River's southern regional sewerage project	502,361	500,200	99.57	▪ Annual electricity consumption 630,427kWh → 566,965kWh
Kobe City	Hyogo	Construction of a terminal sewerage treatment plant (reinforced concrete), construction of sewer pipes, and installation of equipment at pump stations	1,065,601	620,000	58.18	▪ Sustaining environmental benefits of public sewerage systems through renovation/renewal of and seismic countermeasures for aging facilities ▪ Reduction of power consumption and greenhouse gas emissions by adopting sophisticated facilities ▪ Improvement of seismic capacity of sewer pipes and extension of their durable life
Nishinomiya City (1)	Hyogo	Renewal of two or more facilities including those for sewerage treatment / advanced treatment / sludge treatment, and pump stations, sewer pipes, etc.	4,206,027	683,500	16.25	N/A
Nishinomiya City (2)			2,716,036	1,423,600	52.41	
Nishinomiya City (3)			1,230,794	443,000	35.99	
Kakogawa City	Hyogo	Contribution for regional sewerage systems	196,618	192,400	97.85	N/A
Hiroshima City	Hiroshima	Renovation of aging public sewerage facilities, etc.	1,120,000	520,000	46.43	▪ Sludge recycling rate 100% (composting and conversion to cement, fuels) ▪ Effective and full use of digestion gas emitted in the sewerage sludge treatment process to generate power ▪ Reduction of greenhouse gas emitted by sewage treatment (emissions in FY2021 were 30.6% lower than the FY2013 level) ▪ Reduction of power consumption by installing high- efficiency equipment ▪ Annual electricity consumption 5,407,972kWh → 5,244,986kWh
Kure City	Hiroshima	Design work, duty to change business plan, and study of rebuilding	72,606	21,659	29.83	N/A
Fukuyama City (1)	Hiroshima	Projects related to rainwater treatment facilities	10,506	5,253	50.00	N/A
Fukuyama City (2)			275,752	131,314	47.62	
Hatsukaichi City (1)	Hiroshima	Renovation and renewal of private power generation facilities at Hatsukaichi Purification Center	120,000	54,000	45.00	▪ Improvement of public health and conservation of water quality in public waters
Hatsukaichi City (2)			155,700	43,600	28.00	
Iwakuni City	Yamaguchi	Construction for regional sewerage systems	7,919	7,900	99.76	N/A
Tokushima City	Tokushima	Administrative costs for sewerage systems and contribution for construction of office buildings	92,253	92,088	99.82	▪ Improvement of public health and conservation of water quality in public waters

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

(iii) Project by Project Reporting: Others 5

Others (Renewal)

Borrowing Entity	Prefecture	Project Description	Total Project Cost (JPY 1,000)	JFM Loan Amount (JPY 1,000)	JFM Loan Amount/ Total Project Cost (%)	Positive environmental impact
Tosu City (1)	Saga	Relocation of sewerage pipes and manhole pumps in the city, installation of sewerage basins, pavement, and exploratory excavation	232,561	112,279	48.28	▪ Improvement of living environment and conservation of water quality in public waters
Tosu City (2)		Execution design to renovate Tosu City north relay pump station for earthquake resistant and expansion	22,000	11,000	50.00	N/A
Tosu City (3)		Execution design to renovate and renew aging pipes (rehabilitation and replacement)	5,830	2,915	50.00	
Kashima City	Saga	Outsourcing of execution design for a purification center	61,000	30,500	50.00	N/A
Kagoshima City	Kagoshima	Renovation and renewal of aging equipment and sewerage ducts	2,115,862	1,355,000	64.04	N/A
Total Amount of Others (Renewal) (36 projects)			13,861,437	6,399,517		

※ Total Project Cost and JFM Loan Amount that overlap with other projects are excluded from the Total Amount
※ Numbered brackets after borrowing entity are cases where there are several JFM loans in one project, or several JFM loan projects in one borrowing entity

Case Study 1: Fukuchiyama City Sludge Treatment Plant Reconstruction Project

<Rendering image>
Sludge Treatment Plant Reconstruction Project in Fukuchiyama City

Project Overview (Project Period: FY2022 - FY2025 (tentative))

Total Project Cost : JPY 117.4 million
- of which JFM funds : JPY 52.9 million
(Apr. 2022 - Mar.2023)

- The Fukuchiyama Sludge Treatment Plant commenced its operation in 1966, and currently treats ~49,000m3 of sewage annually. As 57 years had passed since the start of the plant operation, sewer facilities showed some signs of aging.
- The Plant started to adopt the evaporative drying method in 1976, and subsequently it commenced the operation of the current sludge incineration plant in 1999. As some 20 years had passed since the construction of the sludge treatment facilities, including the existing sludge incineration facilities, it was about time to refurbish the facilities. Amid such situation, the Sewerage Law was amended in 2015 to require sewerage business operators to make efforts to recycle sludge generated at their facilities.
- Fukuchiyama City has been working on the basic concept /plans for the effective use of sludge since 2017, under which it has launched a project to reconstruct a sludge treatment plant in FY2021 with the target completion in FY2025.
- JFM funds will be used for the development of detailed facility designs for the effective use of sewage sludge, the dismantling of the old sludge treatment plant and the construction of new facilities.

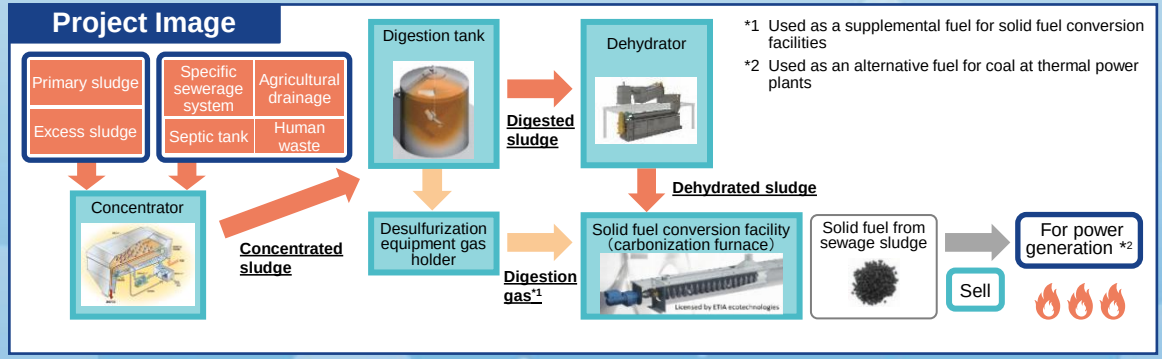
Highlights

Environmental impacts expected from the new construction of solid fuel conversion and digestion facilities

- Aims to reduce greenhouse gas emissions by ~68% to decarbonize sewerage facilities by constructing solid fuel conversion and digestion facilities that effectively utilize the energy from sewage sludge
- The use of digestion gas generated at digestion tanks as supplemental fuel for solid fuel conversion facilities will contribute to the reduction of fossil fuels used at the plant(*1)
- Solid sludge fuels generated at these facilities will be used to replace fossil fuels in thermal power plants (*2)
- Sewage sludge, etc. which will be effectively utilized through this project will include sewage sludge (including drainage from agricultural communities), human waste, and septic tank sludge generated throughout the city, aiming to cover a wider area in the future

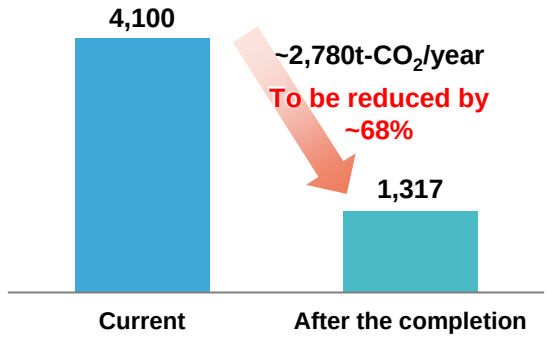
- Reduction in CO_2 emissions: ~2,780t-CO_2/year (~ 68% reduction)
- Sewage sludge recycling rate: 100%

Project Image



Expected Benefits

【Greenhouse gas emissions (t-CO_2/year)】

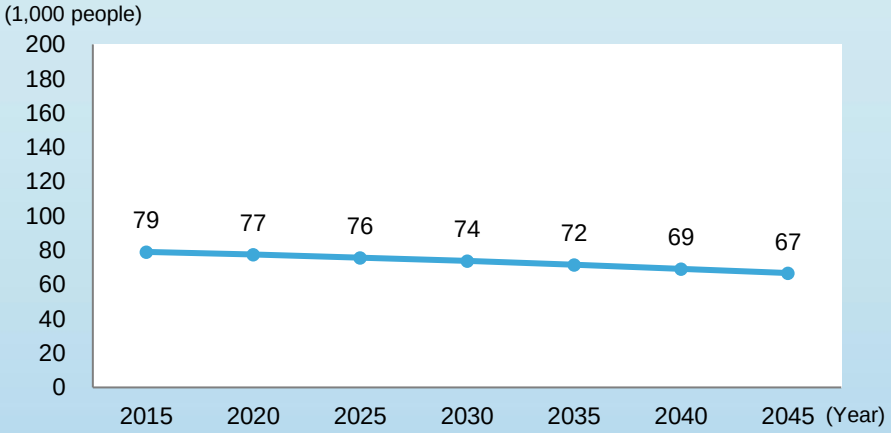


<Reference> Fukuchiyama City, Kyoto

DATA

Population	77,306 (as of October 1, 2020)
Area	552.54㎢ (as of July 1, 2023)
Sewerage Coverage	84.4% (as of March 31, 2022)
City Budget	JPY 47.1 billion (FY2023 General Account Initial Budget)

Demographic Trend



*Source: National Institute of Population and Social Security Research, Regional Population Projections for Japan (2018)

Overview

- Fukuchiyama City, Kyoto, is located in the northwestern part of Kyoto, about 60 km northwest from Kyoto City in a straight line. The city has been developing as a transportation hub connecting Keihanshin and Kitakinki. It is also an industrial base having “Osadano Industrial Park, which is one of Japan’s leading inland industrial park, completed and started operation in 1974, and the “Annex Kyoto Miwa of Osadano Industrial Park.”
- Fukuchiyama Castle, which was built around 1579 by Akechi Mitsuhide who pacified the Tamba area, was destroyed in the early Meiji era and restored in 1986. In 2017, the castle was designated as one of the “Next 100 Most Famous Castles.” In November 2018, the “Ryuo Championship Match,” the highest title match in Shogi (Japanese traditional board game), was held in the castle.
- Located at the foot of Mt. Oe, where there are three oni (Japanese ogre) legends, the “Japanese Ogre Exchange Museum” is a museum exclusively focusing on ogre that is unique in Japan. The museum introduces the oni legends of Mt. Oe and exhibits traditional performing arts related to local oni legends from all over Japan and various artworks on ogre from all over the world such as ogre masks.

Fukuchiyama Castle and Autumn Leaves

Giant Onigawara and the Japanese Ogre Exchange Museum

Case Study 2: Karatsu City Purification Center Digestion Tank Renovation Project

Highly efficient heating system (sludge thermal solubilizing equipment)

Project Overview (Project Period: FY2020 - FY2022)

Total Project Cost : JPY 815.2 million
- of which JFM funds : JPY 367.5 million
(Apr. 2022 - Mar. 2023)

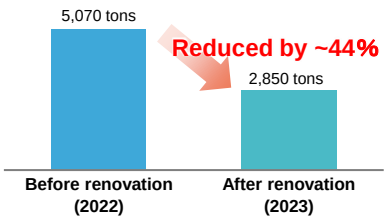
- The sludge digestion tank of Karatsu City's Purification Center was installed in 1985, facing aging problem. The tank needed to be renovated according to a renovation benchmark stated in the city's sewerage stock management plan.
- The current design standards recommend single-stage sludge digestion process, but the city used to treat sludge in double-stage process because the single-stage process using its old tank did not satisfy the required number of days for digestion.
- The city introduced the sludge thermal solubilizing technology adopted in the B-DASH Project (※) of Japan's Ministry of Land, Infrastructure, Transport and Tourism, enabling efficient sludge digestion. This improvement ensures sufficient number of days for digestion and enables single-stage process instead of the double-stage digestion.

Highlights

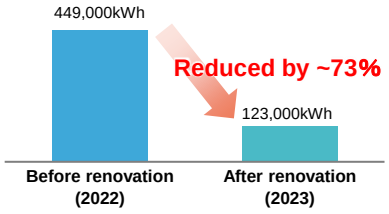
Environmental impacts expected from the highly efficient heating system (sludge thermal solubilizing equipment)

- Introduction of the highly efficient heating system (sludge thermal solubilizing equipment) has reduced moisture content of digested sludge, leading to a ~44% cut in the volume of digested sludge to be discharged and disposed as industrial waste. The annual volume (5,070 tons) is expected to be reduced by 2,220 tons.
- Stirring system for digested sludge was changed to energy-efficient mechanical system from gas-based system, reducing the annual electricity consumption of the entire facility including the solubilizing equipment (449,000 kWh) by 326,000 kWh.

【Annual discharged sludge volume】



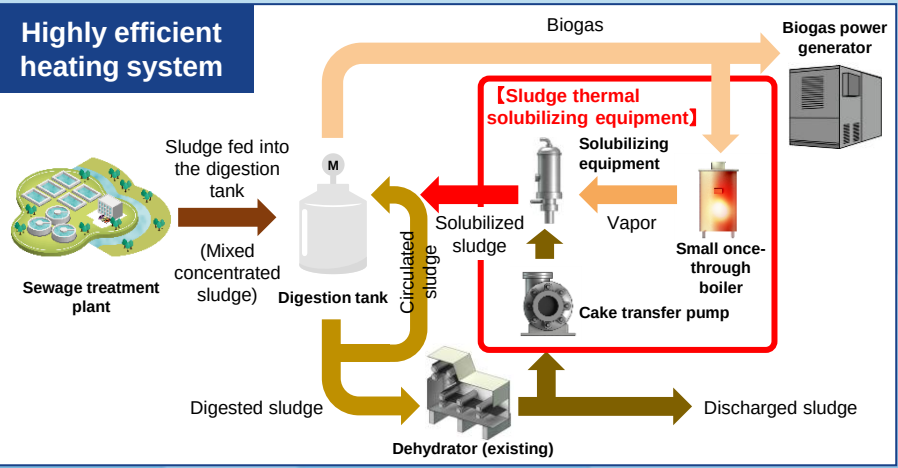
【Annual electricity consumption】



※B-DASH Project
(Breakthrough by Dynamic Approach in Sewage High Technology Project)

The Ministry of Land, Infrastructure, Transport and Tourism studies and demonstrates new technologies' applicability to accelerate R&D and commercialization of these technologies, so as to build a low-carbon & recycling-based society, reduce lifecycle costs, prevent floods and address the aging of equipment in the sewerage system, as well as to support Japanese enterprises' overseas water business expansion.

Highly efficient heating system



<Reference> Karatsu City, Saga

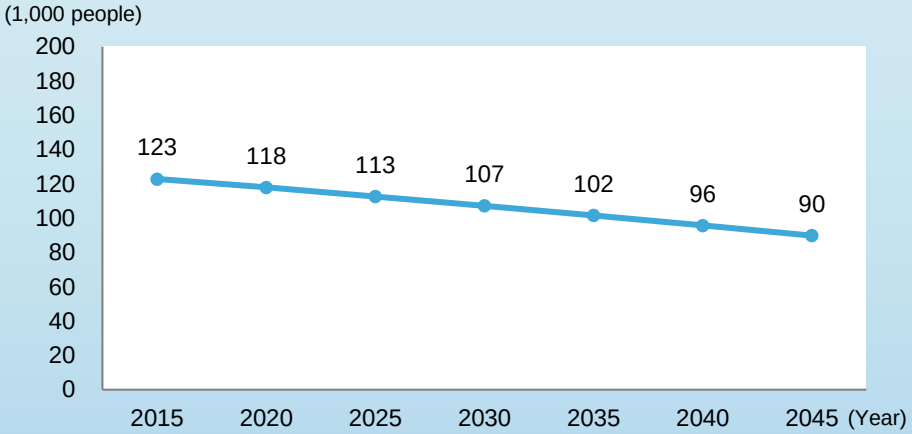
Overview

- Karatsu City, Saga is located in the northwestern part of Saga, having good access to neighboring cities such as Fukuoka City and Saga City. With a population of about 120,000, Karatsu is the second largest city in Saga. Having abundant agricultural, livestock farming and fishery resources such as Saga beef, the city has been thriving with the primary industry by leveraging such resources.
- The traditional regional culture, the “Float Ritual (Hikiyama Gyoji) of Karatsu Kunchi Festival” was registered as a UNESCO Intangible Cultural Heritage. In addition, Karatsu-yaki (Karatsu potteries), a very famous traditional craft, has a history of about 400 years and still plays an essential role in the industries of Karatsu City.
- "Niji no Matsubara" is a pine grove growing along Karatsu Bay like an arc of rainbows. The pine trees were originally planted to establish a windproof and tide prevention grove by Terasawa Shimanokami Hirotaka, the first lord of the Karatsu Domain. The pine grove stretching for approximately 4.5km in length and 500m in width is said to contain about 1 million pine trees. Niji no Matsubara has been designated as one of the three major pine groves in Japan and as a national special scenic beauty spot.

DATA

Population	117,373 (as of October 1, 2020)
Area	487.60㎢ (as of July 1, 2023)
Sewerage Coverage	74.5% (as of March 31, 2022)
City Budget	JPY 73.55 billion (FY2023 General Account Initial Budget)

Demographic Trend



*Source: National Institute of Population and Social Security Research, Regional Population Projections for Japan (2018)

Karatsu Castle and wisteria flowers

Karatsu Bay and Niji no Matsubara (Pine grove of rainbow)