

2022

Annual Report



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CEO's Introduction

I am delighted to present the Water Services Corporation's Annual Report for the year ending 31st December 2022. This report showcases the significant progress we have made in providing high-quality, safe, and reliable water and wastewater services to the people of Malta, while also highlighting our ongoing commitment to sustainability, customer service, and stakeholder engagement.

Despite the challenges posed by the ongoing pandemic, Water Services Corporation has continued to make significant investments in new technologies and infrastructure upgrades, enabling us to improve the efficiency and effectiveness of our operations. We have also focused on sustainability, reducing apparent water losses by 2% and a 2% increase in renewable energy production.

In addition, we have invested heavily in upgrading and modernizing our infrastructure, including the construction of the Pembroke-Ta' Qali Tunnel, which will provide an additional source of water to meet the increasing demand in the central region of Malta.

Thanks to our ongoing efforts, we have achieved some important gains in the past year, including a 5% increase in revenues

and a 66% increase in profitability compared to the previous year. We have also continued to maintain a strong financial position, with total assets of €0.5 billion and a net profit of €11.7 million.

Looking ahead, we will continue exploring innovative solutions to address the challenges posed by climate change and aging infrastructure, and we remain committed to engaging with our customers, partners, and stakeholders to ensure that we continue meeting their evolving needs and expectations.

In this report, you will find detailed information on the performance of our various departments, including water quality, operations, finance, and customer care. We hope that this report provides a comprehensive overview of our

progress and demonstrates our ongoing commitment to providing high-quality, sustainable, and reliable water services to our customers.

I would like to take this opportunity to express my gratitude to our employees, customers, partners, and stakeholders for their ongoing support and trust in our organization. We look forward to continuing our work together to build a more sustainable and resilient future for water services in Malta.

Karl Cilia



Wastewater Infrastructure and Technical Support Services

Wastewater Projects

The Marsaxlokk and Kalkara Pumping Stations are two major projects nearing completion. The rehabilitation of the Marsaxlokk Pumping Station has eliminated the constant infiltration of seawater from the old pumping station and feeding gravity mains. The adjacent gravity mains have also been replaced to accommodate future development in the area. Meanwhile, work on upgrading the Kalkara Pumping Station is proceeding, eventually eliminating all seawater infiltration from the old infrastructure. These enhancements will prove beneficial to the Water Services Corporation.

Planned projects in the Malta South Region include a significant upgrade to the Birzebbuga seafront, replacing approximately 800 meters of gravity sewers. This upgrade will eliminate seawater infiltration and various restrictions in the network to meet future demand. We also anticipate sewage gallery extensions which will further improve, which will further improve the South Region's network and capacity to cater for future demand. These projects will also provide for the elimination of trunk mains from inaccessible areas in the Żejtun district.

In 2022, three EU-funded projects were launched, namely the upgrading of the sewer main at Triq Ix-Xatt in Ta' Xbiex to curtail seawater infiltration; a sewer extension at Sqaq Iż-Żiemel in the Handaq Area of Qormi to serve newly constructed developments in the area; a sewer main diversion in the Marsa Racecourse area. These are all vital projects contributing to the progressive upgrade of our sewer network. The first two projects are planned for completion in the coming months, whereas the Racecourse project is expected to be

completed by the end of 2023. Future planned projects include the continuation of a sewer trunk main upgrade in the Balzan Valley, a seawater curbing sewer replacement project at ix-Xatt ta' L-Imnsida, and sewer trunk main upgrades and diversions from residential areas in Marsa through Triq Diċembru Tlettax.

Wastewater Pumping Stations

Following the procurement of new wastewater pumps in 2021, the focus shifted towards upgrading the electrical and communication panels at various pumping stations. These upgrades have been completed at Tax-Xama, Baħar iċ-Ċaġhaq, and Manikata, while works on the Pwales pumping station are currently underway. These upgrades have significantly enhanced the efficiency and performance of these pumping stations' mechanical, electrical, and communication systems, resulting in better pumping efficiency, lower energy consumption, higher capacity and reduced cleaning and maintenance interventions.

New pumps have been installed in various locations, including Pietà, Marsa Millenia, Gżira, Pembroke, Dragonara (Paceville), and San Ġwann. This year, additional pumps will be installed at Balluta, Exiles, Marsamxett, Mediterranean Conference Centre, Valletta Waterfront (Višet), Fisherman Street (Marsa), and including all necessary complementary upgrades'. These upgrades contribute to improving the wastewater network in the Malta Central Region.

Studies are underway to upgrade the retention capacity of three critical pumping stations to enhance pumping performance while minimising the risk of sewage overflows during failures and wastewater peaks. These pumping stations include Tax-Xama, Sirens, and Buġibba.

The installation of standby generators is also planned for these critical pumping stations, allowing for uninterrupted operation during power outages.

Network Improvements

Wastewater pumping stations are being monitored through sampling for conductivity and chlorides to identify wastewater

network seawater infiltration. The latter is detrimental to the collection network, pumps, and wastewater treatment. Infiltration remediation works are carried out in identified seawater infiltration hotspots.

Continuous improvements are made in collaboration with various entities, such as Infrastructure Malta, INDIS, and the Local Councils. Infrastructural projects are ongoing to assess and upgrade the network accordingly.

In 2022, the Malta South Region targeted extensive cleaning and CCTV inspections on various parts of the sewage network. Cleaning and CCTV inspections were conducted on 18 km of sewers to identify network issues and limitations. These interventions also served a condition monitoring purpose for future upgrades: improving wastewater flow by removing restrictions, eliminating seawater infiltration, and diverting main sewer lines.

Cleaning and inspection works were also carried out on various trunk mains and sewage galleries, crossing fields and major arterial roads, which included the removal of tree roots, construction of new manholes and removing construction debris and other material, mitigating sewage overflows, particularly during wet weather.

Contact Reports

Contact reports received were promptly and effectively addressed in line with our customer charter. Each report was analysed and resolved in a way to prevent reoccurrence. Improvements involved repairing manholes, patching up works and cleaning operations.

Technical Support Section 2022

The Technical Support Services section comprises a body of multidisciplinary employees, led by professional engineers and an architect, providing mechanical, electrical, and civil engineering services.

**FIG Qrendi Booster
.01 Station**



During 2022, TSS commissioned two new water distribution network booster stations in Qrendi and Fawwara (Qrendi – Fig. 1, Fawwara – Fig. 2) and reactivated five boreholes at Harruba, Ghar Hanžir, Qattus, Xlejli, and Ġebel Xejn (Fig. 3). These boreholes were due for extensive structural repair interventions by the Civils Section. These works will extend into 2023, together with the refurbishment of the WSC head offices in Luqa. The TSS also commissioned two new water booster sites at Bidni and Xgharja (Bidni – Fig. 4, Xgharja – Fig. 5).

A major 2022 undertaking and achievement was the support provided on the Pembroke - Ta' Qali Tunnel Project. The Civils Section cleaned St. Maria Reservoir, removing around 800 cubic metres of sediment and effected repairs, contributing to the removal of extensive water leakages. In the early months of 2023, this section also performed similar activities on the Mercieća Reservoir and will be entrusted with the cleaning of the Ta' Qali Reservoir from March 2023 onwards (Fig. 6). In addition to the potable water reservoirs, the Civils Section

undertook repairs on the New Water reservoirs, necessitating labour-intensive interior re-lining.

Electrical and mechanical technicians, supported by the section's engineers, successfully designed and implemented a major temporary pumping station arrangement (Fig. 7 and Fig. 8). TSS will be decommissioning the underground water booster system in 2023 in preparation for a major overhaul of the existing system.

**FIG Fawwara Booster
.02 Station**



FIG Ġebel Xejn
.03 Borehole



FIG Bidni Booster
.04 Station



FIG Xghajra Booster
.05 Station



FIG Ta' Qali
.06 Reservoir



FIG Temporary and
.07 Contingency Pumps



FIG Temporary and
.08 Contingency Pumps



FIG Bahar ic-Caghaq Wasteserve .09 Pumping Station



A prototype project that kicked off in 2021 was successfully deployed in 2022. An Active Energy Management system was implemented at 44 wastewater pumping station sites to compute a Pump Energy Indicator (PEI). This system will assist with predictive maintenance by facilitating early detection of pump failures through an analysis of energy expenditure trends. New Telemetry operated Motor Control Panels were also successfully installed at Tax-Xama, Manikata, Xara Lodge, Marfa and the Bahar ic-Caghaq wastewater pumping stations (Bahar ic-Caghaq WWPS – Fig. 9).

The upgrading and maintenance of properties owned by WSC is an ongoing process. During 2022, TSS transformed an unused underground space into a chemical store for the WSC lab, refurbished a new wing for the Accounts and HR sections in Luqa, and initiated refurbishment works on the Naxxar District Offices.

Future plans are in the pipeline for civils upkeep on all reverse osmosis and wastewater treatment plants. Additionally, several reservoirs and outstations are planned for refurbishment and upgrading.

FIG Kordin Workshop .10 Statistics

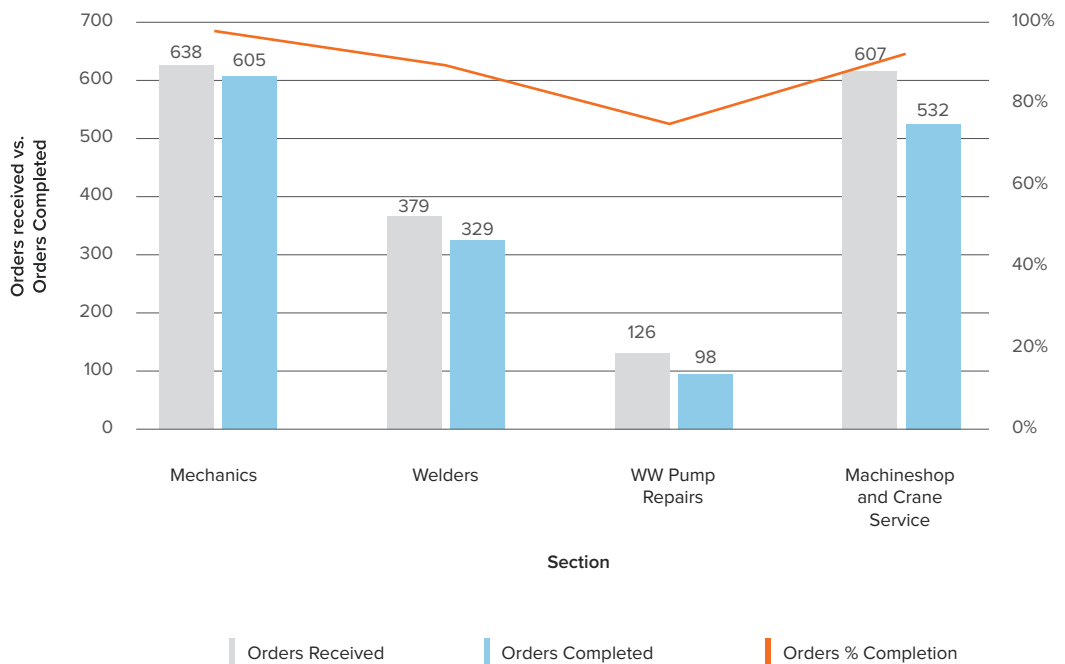
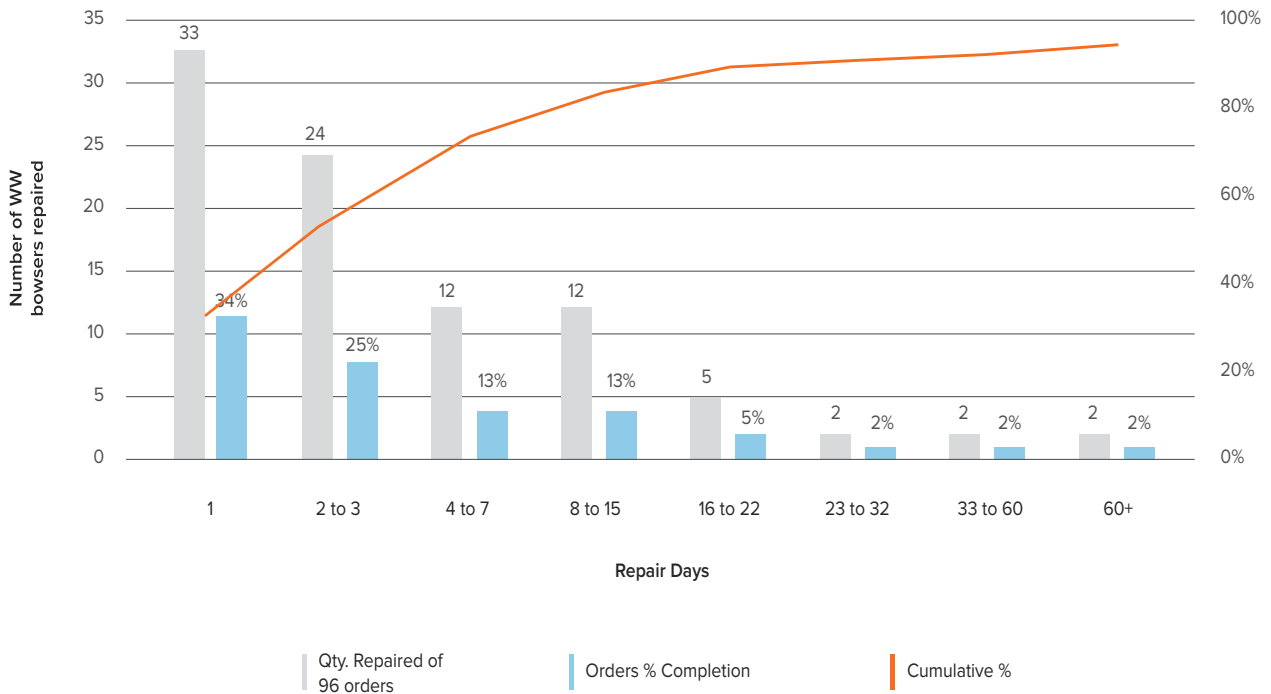


FIG .11 Kordin Bowers



Fleet Management

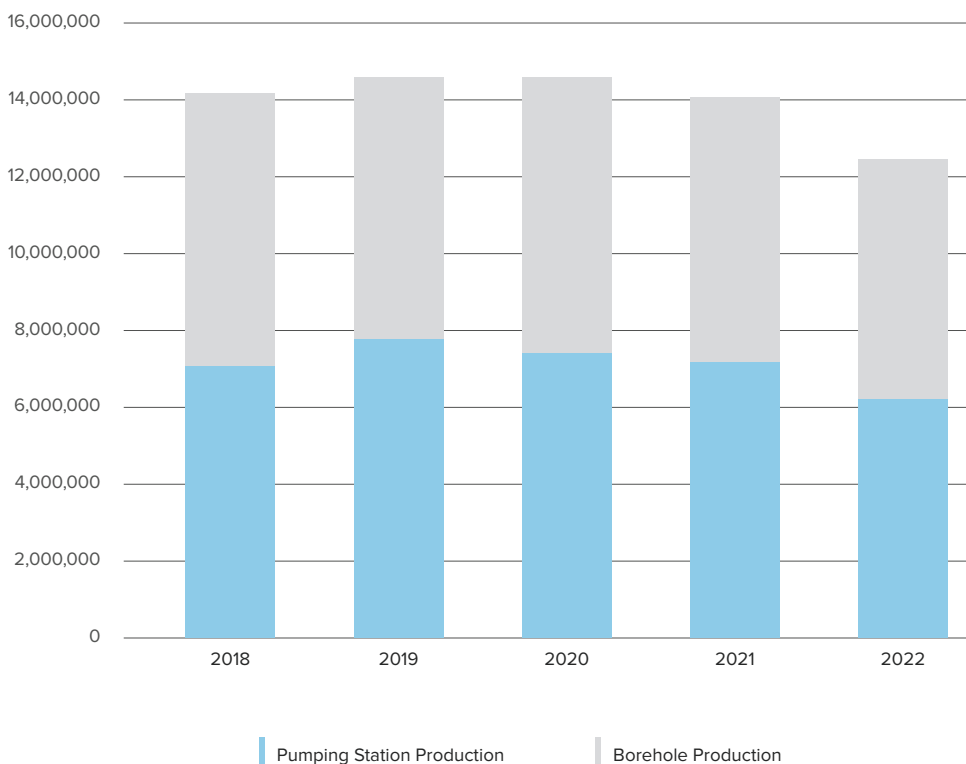
During 2022, WSC initiated a public procurement process to modernise its fleet via leasing. This endeavour acquired 37 fully electric light vehicles, 67 small panel vans, 15 large panel vans, and 5 trucks. This initiative’s final phase will see 25 large pickup vans and 47 box vans added to the fleet in 2023. Through this modernisation effort, we anticipate a significant improvement in fuel efficiency and decreased CO2 emissions.

Production and Treatment

Water Production

In 2022, the Water Services Corporation (WSC) produced 35.5 million cubic meters of potable water to meet water demand. The Corporation achieved this through its Reverse Osmosis plants and groundwater production sites. Groundwater accounted for approximately 36% or 12.7 million cubic meters of potable water production.

FIG ground water
.12 production trend



Groundwater is abstracted from 68 boreholes and 10 pumping stations in Malta, and 37 boreholes and 2 active pumping stations in Gozo. The production volumes of groundwater from active sources are summarised in Fig. 12. Targeted improvements in the potable water blend salinity levels led to decreased groundwater production, resulting in increased output from Reverse Osmosis plants.

Spatial Distribution Of Ground Water Abstraction

To relieve pressures of localised abstraction, the WSC is committed to utilising groundwater sources that have not been used for several years. This spatial distribution project was initiated in 2019 and extended into 2022, with five additional sources being refurbished to contribute to groundwater production. In total, eight sources were reactivated until 2022, and in 2023, the WSC plans to reactivate other sources across Malta.

Increase In Water Production From The Seawater Reverse Osmosis Plants

The total amount of water produced from Reverse Osmosis plants in 2022 was 22.9 million cubic meters, accounting for 64% of the complete blend or an average of 62k cubic meters per day. The peak summer production reached 71k cubic meters per day in August. The production during this period was 13.5% higher than the production of water from the RO plants in 2021 due to an increase in water demand and the need to improve the chloride level of the blend.

Circa 52.9% of RO water was produced from the Pembroke RO Plant, while the new plant in Hondoq, Gozo, contributed 5.0% of the total desalinated water. Although the Hondoq RO plant operated under 'testing' conditions for the first few months of 2022, it ran continuously

with two trains from May 2022, giving the flexibility to transfer RO water to Ta' Ċenc' reservoir and also to Malta. With the operation of the Hondoq RO plant, Malta is now receiving desalinated water from Hondoq. Prior to Hondoq, the submarine pipeline was only utilised to supply water from the Ċirkezza RO plant to Gozo. The Hondoq RO is the most efficient plant, consuming 23.5% less energy than conventional plants, thus improving Malta's desalination efficiency.

The Desalination unit within WSC is upgrading the RO plants in Malta to increase the production capacity and improve energy efficiency, to ensure that desalinated water is produced at the minimum possible cost.

FIG 13 Desalinated water production trend

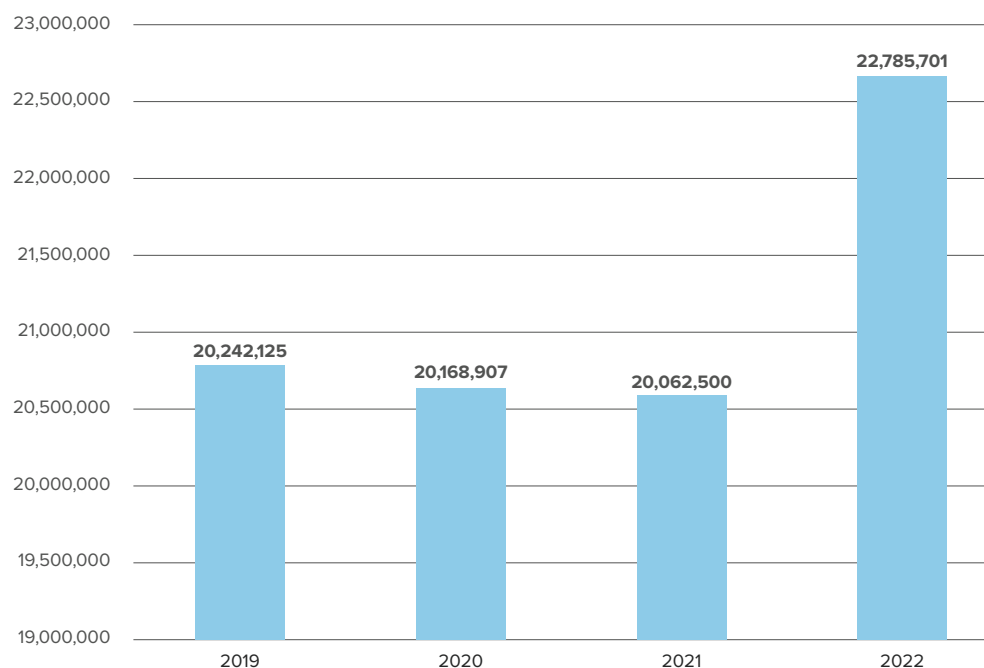
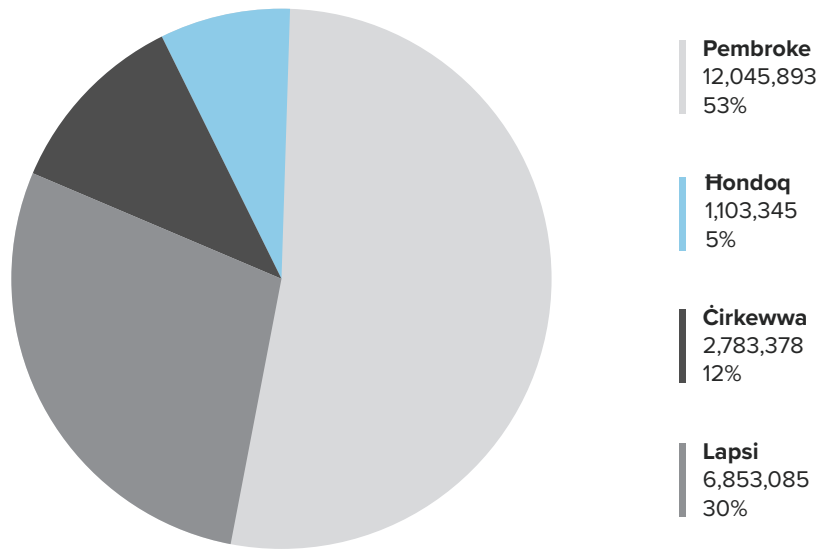


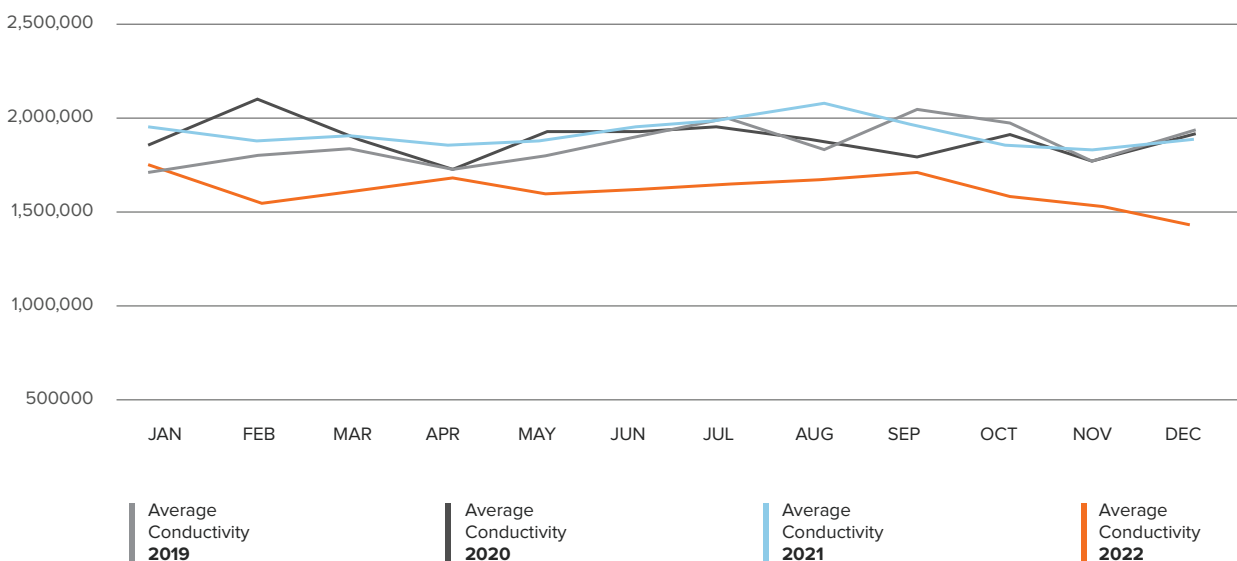
FIG .14 Production from each Seawater Desalination plants



Salinity Reduction in Potable Water

The Water Services Corporation has devised a plan to curtail the salinity of the potable water blend by the year 2024. As per the latest report, water salinity has been reduced by a significant 17% during 2022, compared to the average levels recorded in 2021. The average monthly salinity values, measured by water conductivity, are illustrated in Fig. 15 below. The target for 2023 is to stabilise the salinity level at 2022 levels. The Corporation intends to improve water quality by reducing water salinity, which will be made possible once the new tunnel connecting the Pembroke RO Plant to the Ta' Qali group of reservoirs enters operation.

FIG .15 Average conductivity at major reservoirs in Malta



Reserves

In line with WSC's strategic objective to increase potable water reserves nationwide and further enhance water security, several potable water reservoirs have undergone maintenance inspections in 2022. The reservoirs emptied for inspection include the Naval Reservoir in Luqa, Santa Marija, the Merċieċa Reservoirs in Attard, the Luqa Reservoir in Luqa, and Manikata Reservoir in Mellieha.

FIG Luqa reservoir filling up after major rehabilitation works
.16



FIG Cleaning and inspection was
.17 carried out at Manikata Reservoir



Discharge Permitting Unit

Inspections

The year 2022 has been productive, primarily due to the addition of newly recruited staff members with the Discharge Permitting Unit (DPU) team. The DPU inspectors conducted 6,751 inspections (+1890 compared to 2021) at various establishments from varying industries in Malta and Gozo. In addition to routine inspections, the DPU is responsible for conducting investigations related to illegal discharges, which often require the collaboration of other sections within the WSC and police intervention, owing to their complex nature. In 2022,

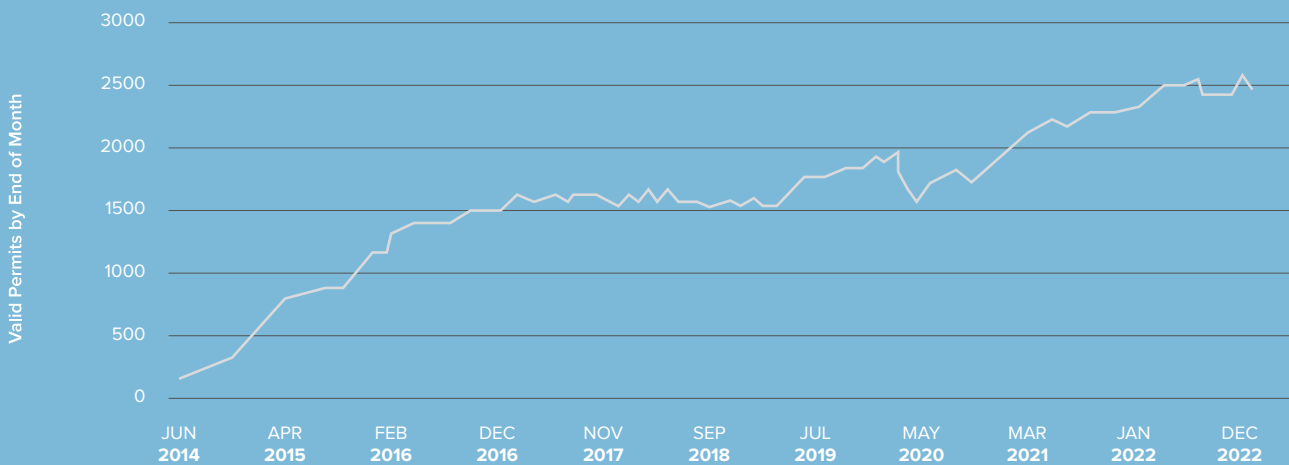
the DPU established a new Compliance Unit within the section, spearheading ad-hoc investigations, reviewing permitted entity compliance against their permit conditions, and conducting rainwater compliance inspections. In total, the Compliance Unit performed 805 inspections in 2022.

Permits

In 2022, the DPU issued 2,509 permits (+100 compared to 2021). The Discharge Permitting Unit focused on reviewing its operations to ensure that the permitted entities' compliance level satisfies the highest possible standards. The added scrutiny led to a slight dip in the total number of permit renewals, which stood

at 2,186 for 2022, a marginal decrease of 15 permits compared to the previous year. However, the total number of entities covered by a valid permit by the end of 2022 was higher (+89 compared to 2021), with the total number of valid permits now standing at 2,492. A timeline depicting the increase in the number of entities covered by a permit since July 2014 is presented in Figure 18.

FIG 18 Valid permits issued by DPU



Enforcement

In 2022, the DPU intensified its enforcement efforts to curb instances of non-compliance instances. A significant shift was witnessed in September 2022 when the DPU started issuing Notice to Comply (NTC) letters to non-compliant entities, officially notifying them of their transgressions. This step paved the way for the forthcoming update of the Sewer Discharge Control Regulations currently in force (S.L. 545.08), which

update is expected in 2023. The DPU has issued 176 NTCs since September 2022, and 11 legal letters were directed to non-compliant entities by the end of the year. In addition, several NTCs were successfully actioned and closed, with the respective entities achieving compliance.

Other Initiatives

In 2022, the DPU launched an extensive monitoring program focusing on collecting

wastewater samples from industrial and residential areas. This program will span 18 months, allowing the DPU to better understand the baseline wastewater quality in the Maltese Islands. Additionally, it will help identify areas of the sewer network that consistently have a lower wastewater quality, hence demanding added attention.

Wastewater treatment and New Water reclamation plants

During the review period, 20.9 million cubic meters of wastewater were treated at the Ta' Barkat, Ćumnija, and Ras il-Hobz wastewater treatment plants.

At Ta' Barkat, sludges are processed further through bio-digesters to recover renewable energy from wastewater. In 2022, the anaerobic digesters produced 3.81 GWh of renewable electrical energy from biogas, an 8% increase over the preceding year. This electricity powers the plant itself, accounting for over 20%

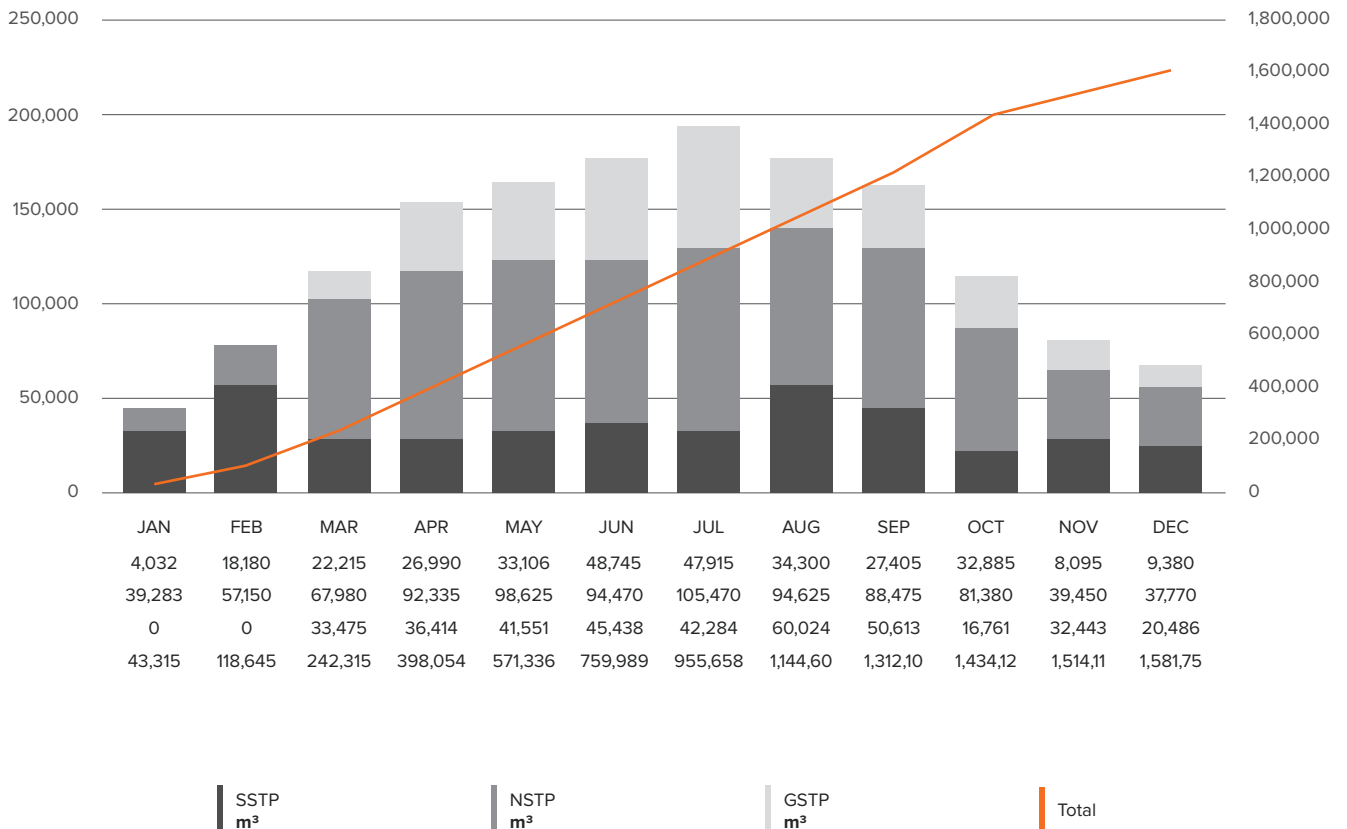
of its overall energy requirements, while the thermal heat generated by the CHP (Combined Heat and Power) generators supports the anaerobic digestion process. The three CHP dry coolers were upgraded and replaced this year to operate more efficiently during the hot summer period. A new, higher-capacity biogas dryer was installed, improving biogas feed quality and generator performance.

Treatment processes were tweaked to reduce sludge production and increase dryness fraction. WSC is planning an extensive investment to further improve the dryness of sludges produced and reduce the volumes disposed to the landfill.

New Water production

All wastewater treatment plants registered an increase in New Water production year on year. Ta' Barkat witnessed a 24% increase, while Ćumnija and Ras il-Hobz increased their throughput by 7% and 34%, respectively. The combined New Water production in 2022 was 1.6 million cubic metres.

FIG New Water monthly production - 2022



Sant' Antnin Farmwaste and Wastewater Treatment Plant

The Sant' Antnin wastewater treatment plant in Marsascala has been retrofitted with the latest energy-efficient wastewater treatment technology, with a maximum treatment capacity of 17,000m³/day. This plant treats wastewater under testing conditions and is expected to be fully operational by 2023.

Farmyard Waste Treatment Facility

In 2022, the Farmyard Waste Treatment Facility, which commenced operations in April 2021, processed 33k cubic meters of animal waste. The peak monthly volume handled by the plant was 3.8k cubic meters recorded in January. A total of 2,133 tankers were deployed to transport the farmyard waste to the Wastewater Treatment Plant at Sant'

Antnin in Marsascala. About 110 cubic meters of farmyard waste were processed daily, between Monday and Saturday, throughout 2022. Moreover, a total of 1,825 full skips of solid fraction were produced. The animal waste treated at Sant' Antnin and Gozo plants reached an impressive 80k cubic meters.

FIG Receiving Area
.20



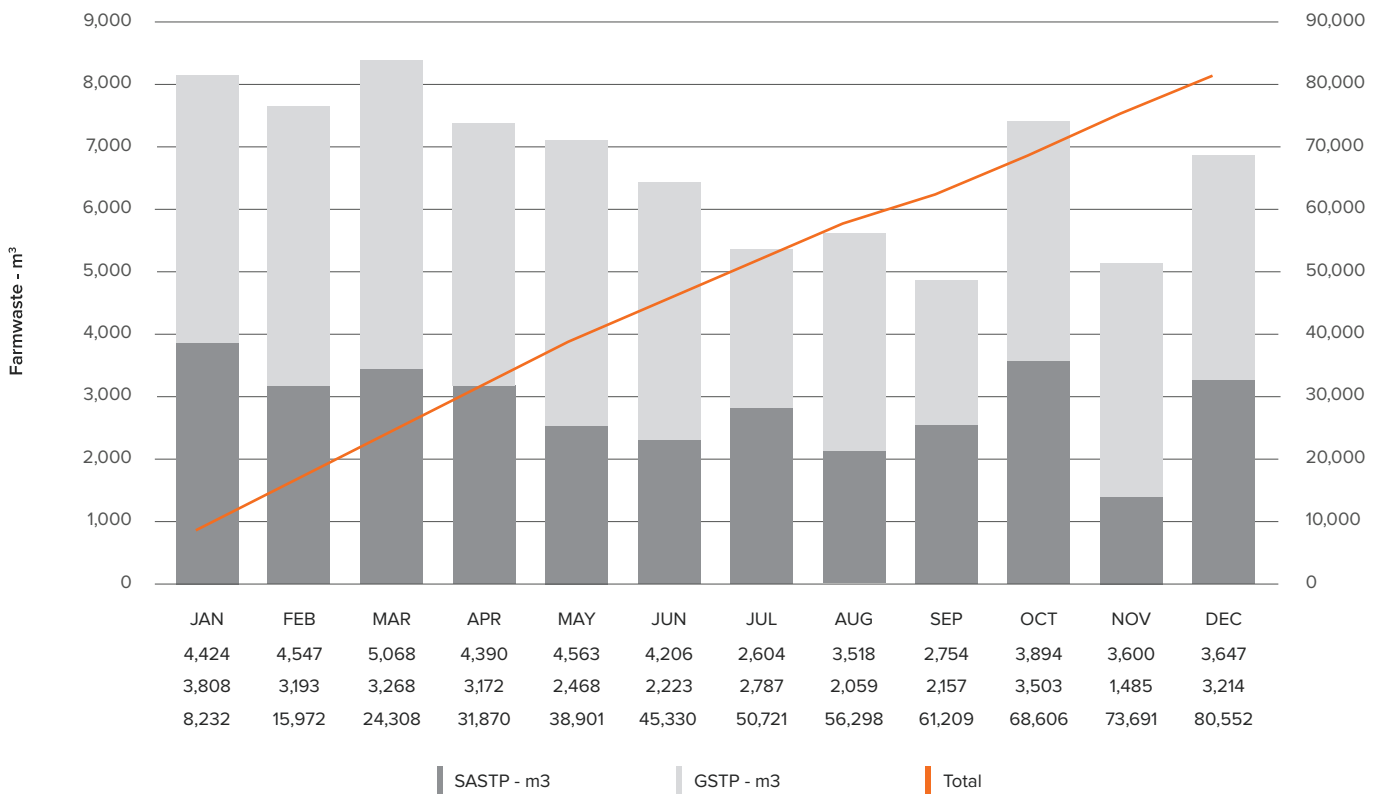
FIG Separator
.21





FIG .22 Solid Fraction Disposal Area

FIG .23 Monthly farmyard waste treated at Sant' Antnin M'Scala and Gozo Plants



The disconnection of farmyard waste from the WSC wastewater collection network is paramount to ensure consistent wastewater treatment efficiency all year round. Moreover, commissioning the new wastewater treatment plant at Sant' Antnin and enacting stricter wastewater network discharge control regulations will further contribute to a more robust and resilient wastewater treatment setup.



Quality, Research and Projects

Quality Assurance & Management Systems

At WSC, we have consciously decided to subscribe to the International Standards Organization since 1998. WSC holds ISO9001 and ISO14000 certifications, adhering to a documented management system. These globally recognised standards provide peace of mind to our clients and customers regarding the quality of our services and how we operate. In line with our commitment to these standards, regular internal audits are conducted throughout the year, in addition to an annual audit by external assessors.



Our Quality Management System, based on documented processes, shows how we **accomplish our quality commitments and beliefs**, and meet the requirements of ISO9001:2015

In 2022, 216 employees underwent training on ISO management systems, and 56 internal audits were conducted, with 56 corrective actions raised as a result. This commitment yielded commendable results, as evidenced by the external audit conducted by SGS in September 2022, which rendered zero non-conformities and five observations for further improvement.

Quality Control - WSC Laboratory

The WSC Laboratory is ISO 17025:2017 accredited, specialising in water and wastewater analysis. Most of our analytical tests, chemical or microbiological, are accredited, ensuring strict quality control measures. These tests are periodically cross-checked with external Proficiency Testing and Certified Reference Materials to guarantee the results' credibility. Over the past year, the laboratory made significant efforts to transition from a paper-based QMS to an online LIMS platform. It completed the first stage and passed its 4-year reassessment in July 2022.

The analysis conducted by the WSC laboratory can be categorised into three distinct functions:

- Process monitoring:** Just under 70% of all analyses conducted by the laboratory are regular process monitoring tests performed weekly and monthly to ensure that all processes observe the required limits.
- Legal compliance:** Analyses are conducted to comply with legal requirements stipulated by WSC's regulators and the Drinking Water Directive. This includes monthly sampling from all Water Quality Zones, including private individual households, which are analysed per legal requirements. Such analyses are reported to the local authorities, who compare the results against the general legal obligations. The latter derives from the European Drinking Water Directive, Urban Waste Water Treatment Directive, and Water Reuse Regulations and their transposition to local legislation.
- Commercial testing:** The laboratory also conducts analyses of water and sewage samples from third parties, including well water, swimming pools, compliance testing, and sewage.

Potable water in the Maltese islands is a blend of groundwater abstracted from pumping stations and reverse osmosis water from WSC's four seawater desalination plants. The blend between the two happens in various reservoirs, from where the water is then distributed for consumption.

2022	Number of Samples
Tap water Village points	876
Water Reservoirs	554
Pumping Stations	661
Boreholes	1005
Reverse Osmosis	1062
Water Leakages	749
Laying of new mains	386
Internal investigations	1431
Customer complaints	126
Private customers	3614
Sewage Treatment Plants	3577
New Water Monitoring	620

Last year, WSC promised the below quality improvement in figures:

	2021	2022	2023
Chlorides(ppm)	500	400	300
Conductivity (µS/cm)	1900	1600	1200
Total Hardness (mg/L)	250	<220	<195

The below has been achieved for 2022 for Malta:

	2022
Average Chlorides(ppm)	384
Average Conductivity (µS/cm)	1503
Average Total Hardness (mg/L)	215

The Corporation maintains 12 distinct zones for monitoring water quality. Still, through a series of initiatives, including completing the Ta' Qali – Pembroke tunnel in Malta and the entire operation of the Hondoq RO in Gozo, this number will decrease to five by the end of 2023. Quality is of paramount concern, and we are continuously striving to enhance the quality of our tap water, ensuring that all of our clients receive water of an exceptional standard.

A. Monitoring of Wastewater

The WSC Laboratory's wastewater monitoring program comprehensively analyses all phases of the sewage treatment process, from raw sewage to treated effluent, with samples serving as a process control measure and a benchmark against the Urban Wastewater Treatment Directive (UWWTD). However, illegal discharges into the sewer collection network, particularly those from farms, are leading to non-compliance situations. The Corporation has already established two farmyard waste treatment facilities, one in Malta and one in Gozo, and is finalising agreements with farm

owners to ensure that all farm slurries are directed to these dedicated facilities for treatment. Plans to further enhance the monitoring of sewer discharges and upgrade sewage treatment plants are already in motion, with 2,305 sewage samples from the South STP, 736 from the Gozo STP (UW+FW), 423 from the North STP (UW), and 113 from the SASSTP (FW) being analysed in 2022.

B. Monitoring of New Water

The supply of New Water, or highly polished reclaimed water, is strictly quality-controlled to prevent environmental, human, and animal health

risks. The WSC Laboratory samples and analyses New Water from three treatment plants, reservoirs, and water dispensing points. The results are checked against the requirements for water reuse (EU regulation 2020/741), with our water conforming to quality class A, meaning it is suitable for irrigation of all food crops consumed raw where the edible part is in direct contact with reclaimed water and root crops consumed raw. Farmers increasingly demand this high-quality New Water, with 55 samples from the South, 72 from Gozo PP, and 101 from North PP being analysed in 2022.

Research and Innovation

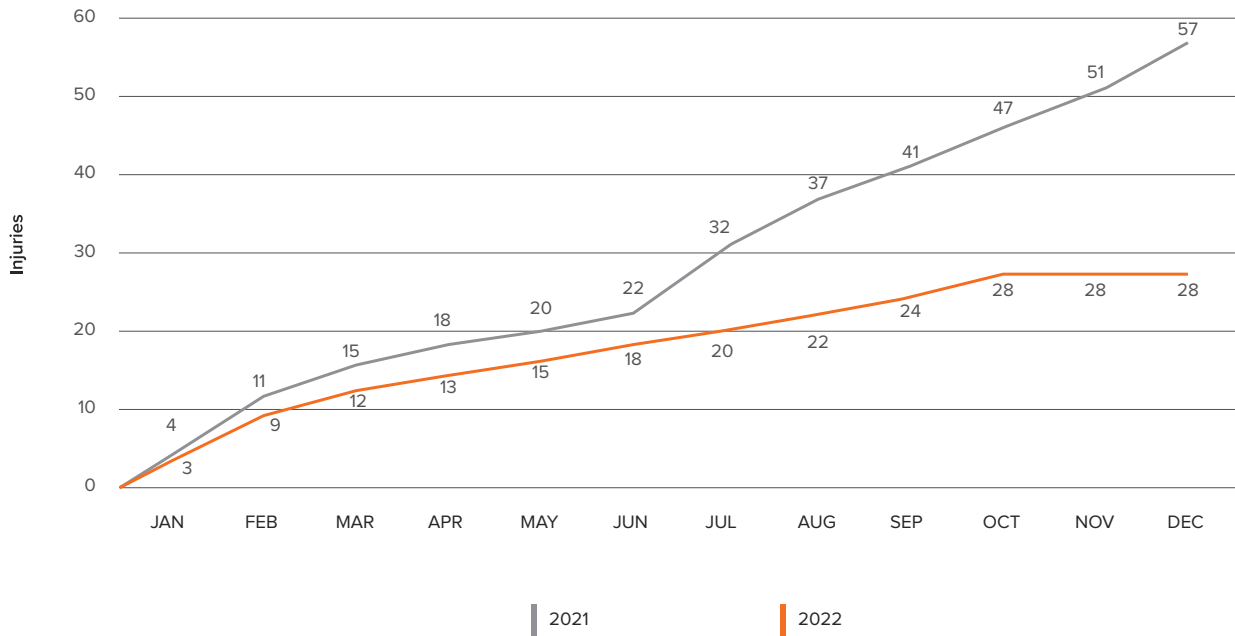
The Water Services Corporation's Quality, Research & Development department has collaborated with the University of Malta's Food Sciences and Nutrition department and secured funding from The Energy and Water Agency through the Renew Platform.

Improving the taste of tap water

The goal of the project is to enhance the taste of tap water. Chlorination has been the primary disinfection technology used for treating local potable water for years, but it generates free chlorine residual and disinfection by-products that compromise the sensory attributes of drinking water, discouraging the population from consuming it. Project PURILMA identified viable alternative-to-standard chlorination technologies for treatment, with the aim of a) reducing the disinfectant and/or chlorination dose used for microbial inactivation and b) attenuating the negative impact of putative disinfection by-products on its organolepsis while safeguarding its safe-for-consumption characteristics. The consortium subjected ultraviolet C (UVC) irradiation,

hydrodynamic cavitation (HC), ClO₂ generation, and electro-chlorination to bacteriological and physicochemical bench-scale studies to assess their bacterial inactivation efficacy and by-product generation propensity, respectively. All tested technologies, except for HC, achieved a minimum of 3 Log₁₀ microbial inactivation, with electro-chlorination and ClO₂ appearing more effective over neutral and alkaline pH conditions. For feasibility studies, the performance of the technologies were further evaluated in the following areas: a) implementation, b) practicality, c) adaptability, d) integration, e) environment & sustainability, and e) cost-effectiveness.

FIG Number of Injuries Comparison
.24 2021-2022



To effect change, one must proactively engage in action. Health and Safety (H&S) compliance inspectors conduct day and night assessments of both contracted works and internal operations to identify risks as early as possible and instigate the necessary corrective actions to prevent accidents. Regular risk assessments are conducted, and the H&S department tirelessly pursues and supports the correction of any identified non-conformities to achieve compliance in the shortest possible time.

Total number of construction sites inspections	1522
Total number of WSC operations inspections	1867

Waste Management

The Corporation generates a substantial amount of waste, including construction, general, paper, plastic, WEEE, chemicals, and fibreglass. Waste management is becoming increasingly regulated and expensive, and dumping waste in a skip is no longer an acceptable solution. WSC educates its employees on the various waste categories and how to dispose of them efficiently. The Corporation invests heavily in waste management to ensure separation at the source and to explore opportunities to convert waste into revenue.

2022	Quantity (Tons)	Cost/Income (Euros)	
Waste disposal cost	2703	86,769	4% decrease on LY

Training and Development

In 2022, further to a relaxation of group meeting COVID-related restrictions, WSC's Training and Development (T&D) team trained 1,220 employees in various courses directly related to their job duties, representing a 70% increase in training provided and a 100% increase in trained employees compared to the previous year.

	2021	2022
The number of employees trained	562	1220
Number of hours of training given	5220	8740
Number of courses given	20	35

The courses covered technical, health and safety, legal, personal development, administrative areas, and sponsorships. In addition, WSC's Institute of Water Technology (IWT), which is WSC's training hub, ran its first MFHEA-accredited course in trenching and pipelaying and planned to progress towards an online Learning Management System to increase its reach.

Projects Section

The Projects Section maintains four vital network components: groundwater, potable water, sewer, and New Water. These components lie at the core of the Corporation's operation, demanding continuous renewal and extension.

The Corporation employs dedicated professional project managers supported by a technical team of surveyors, technical coordinators, and an administrative back office to oversee the entire process, from proposal to execution and closure.

In 2022, the Projects Section carried out 32.77 km of trenching works and published 22 tenders amounting to over €100M in network renewals and extensions. A significant amount of work was completed on expanding the New Water network in Gozo and Malta, co-funded through EU Cohesion and EAFRD funds. These works are ongoing, primarily in Malta South and Malta North. The New Water network also entails upgrades to

dispensers and real-time communication via optic fibre. Additionally, a number of New Water reservoirs have been refurbished to meet present demand and future growth.

With a priority to ensure the quality of potable water supplied, the Corporation replaced 9km of ageing water mains contributing to rusty water. The Corporation is perfectly aware that network interventions do create some disturbance to the public. The H&S section supports the Projects Section, and project supervision is carried out tirelessly to keep contractors in check and ensure that the interventions do not give rise to unnecessary safety issues for road users and operatives working onsite. The Projects Section continuously liaises with various stakeholders and entities such as Transport Malta, Heritage Malta, Enemalta, the telecom companies, local councils, residents, farmers, and

business owners in the areas of any planned work to keep them abreast on WSC's plans and progress.

WSC also collaborates with other entities involved in road infrastructural upgrades, such as Infrastructure Malta, the local councils, and GHRC. Where road upgrades are envisaged, WSC assesses its buried infrastructure to determine whether a replacement or upgrade is required and actions the findings accordingly. For example, in 2022, around 70km of pipework was replaced, reducing the likelihood of failures triggered by the disturbance of newly asphalted road surfaces.



Finance and Administration

Financial Performance

In the wake of the pandemic, the Corporation's remarkable year of growth and consolidation has translated into exceptional financial results for the year under review.

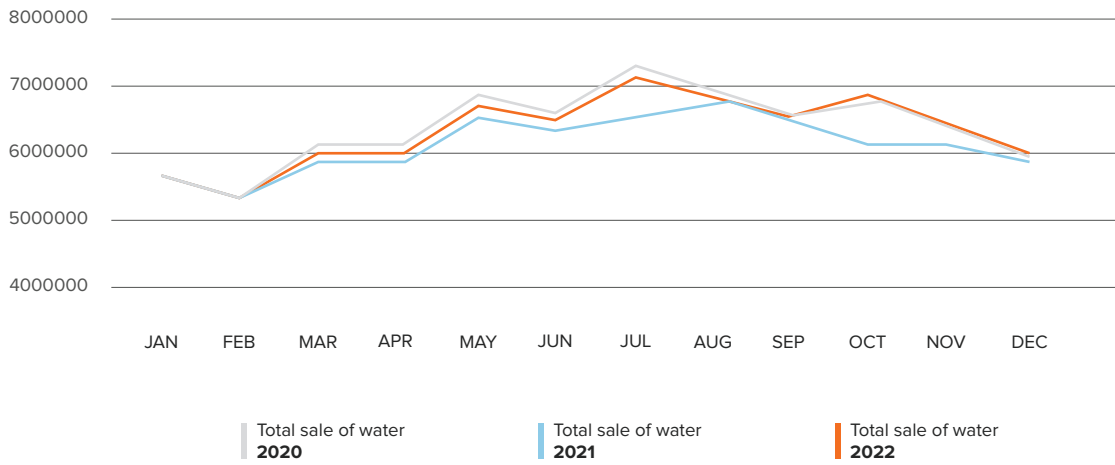
Accordingly, the financial results presented in Table 1 have been prepared and audited by International Financial Reporting Standards (IFRSs) and were approved by WSC's board of directors on May 23rd, 2022.

TBL Summary of .01 Financial Results

	2020 (Audited)	2021 (Audited)	2022 (Audited)
	€ '000	€ '000	€ '000
Turnover	105,675	107,615	113,231
Expenditure	(94,795)	(100,286)	(101,366)
Profit from Operations	10,880	7,329	11,865
Finance Income	1,497	1,466	1,377
Finance Payable	(1,845)	(1,724)	(1,535)
Net Profit for the period	10,532	7,071	11,707

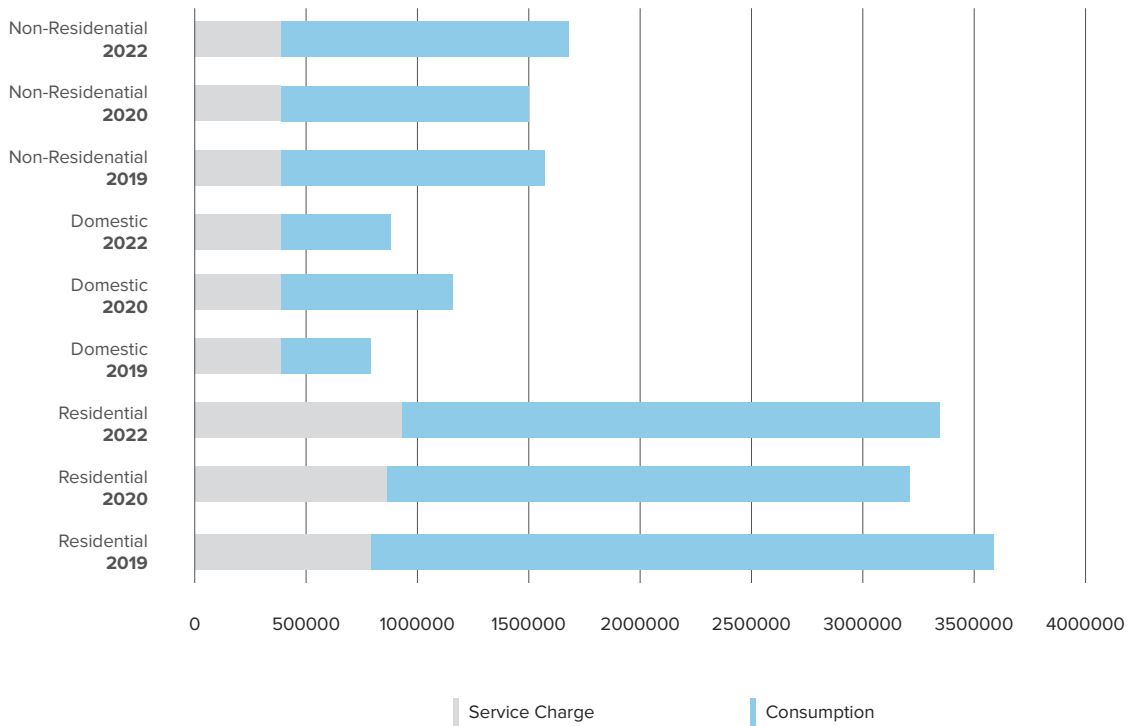
The financial performance during 2022 resulted in a cumulative profit of €11.7 million, implying an impressive increase of 66% over 2021. This surge in profits was primarily due to the Corporation's revenue growth. The smart metering replacement program, coupled with an increase in water consumption, resulted in an overall revenue increase of €4M, equivalent to 5%, in the sale of water. This growth occurred despite the introduction and implementation of the revised billing structure.

FIG Billed Sales on Water, .25 Year-on-Year



Revenue analysis by consumer categories indicates domestic accounts have rebounded from the decline suffered during the pandemic year, with the cumulative decrease in 2022 narrowing to 1% year-on-year. In addition, residential consumption resulted in a cumulative increase of 5%, while non-residential billing increased by 12% year-on-year.

FIG Cumulative Sale of Water by Category, year-on-year



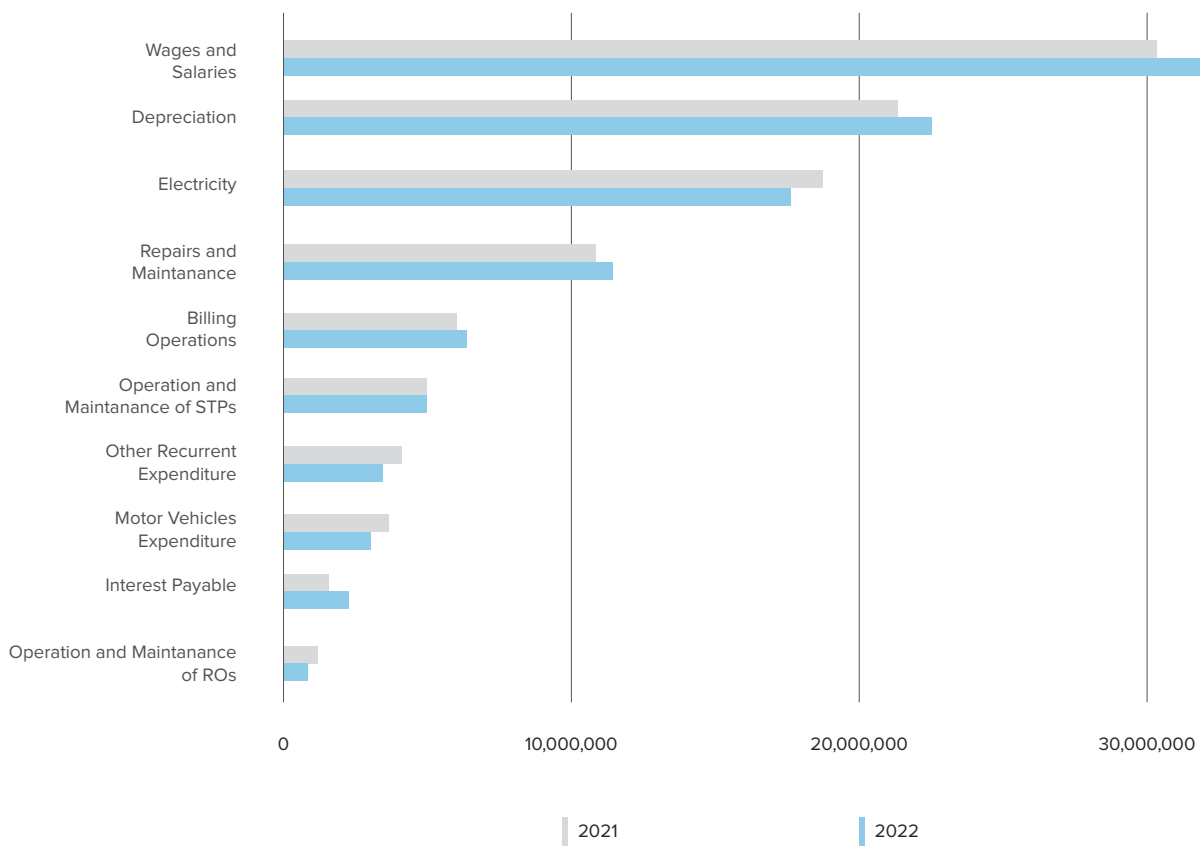
On the other hand, expenditure increases were mainly driven by a planned, albeit significant, increase of circa €2M in the energy consumed by the Corporation. This followed a strategic decision to improve potable water quality by increasing the production from its reverse osmosis plants. This added expenditure was partly netted against significant savings on its repairs and maintenance cost category, amounting to €1.5M. This was due to a reduction in the repairs, mainly to its wastewater network, with efforts being instead diverted to capital investment to replace the old and deteriorated mains. Other recurrent

expenditures increased by circa 9% year-on-year. This increase was driven by a move towards subcontracting security services rather than increasing recruitment costs and an increase in consultancy engagements, required primarily in waste management, metering and EU-funded projects.

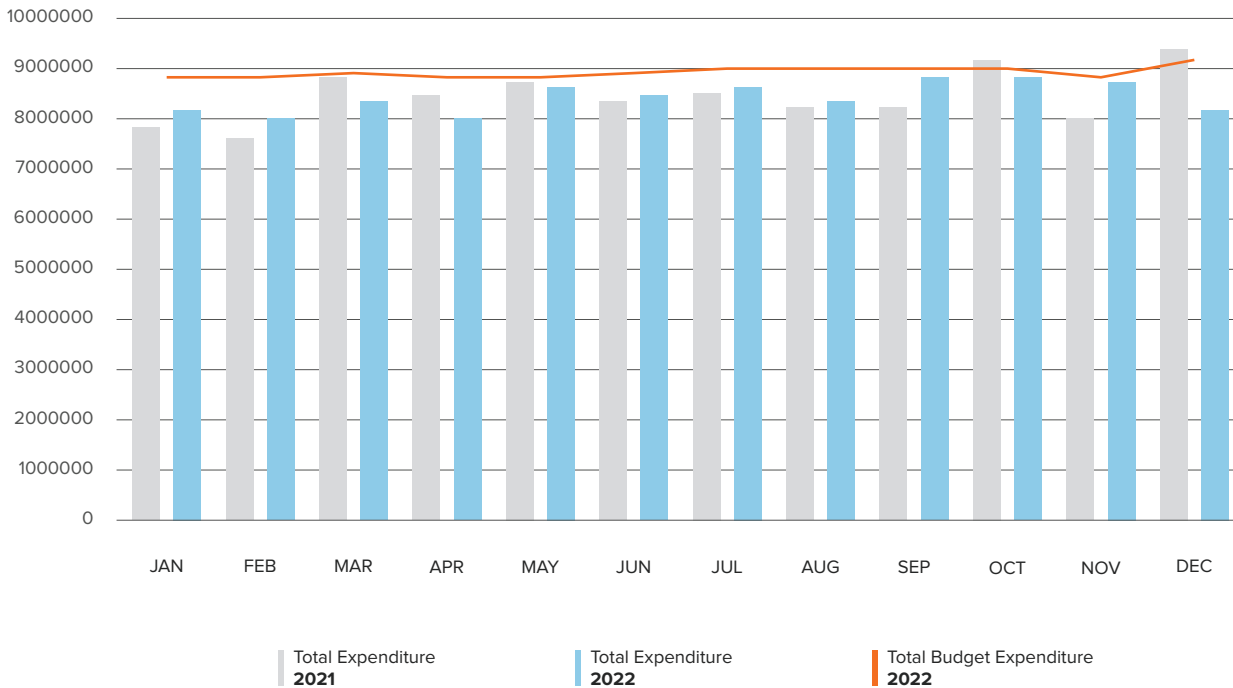
The reduction in the bank interest payable was only possible by repaying €17M in loans into a newly established revolving facility. However, the sudden increase in the bank interest rate during the end of the year is estimated to negatively impact the Corporation's financing cost

during the coming months. Through the revenue increases, the Corporation also managed to decrease its liabilities by circa €7M. Notwithstanding these repayments, the Corporation's cash position remained sustainable, with the acid test at 0.60 at the end of the year under review. Apart from better cash management, the Corporation continued to increase its efforts to reduce its trade receivables by €2.5M over the previous year, representing an 11% year-on-year decrease.

FIG Expenditure per Category – 2021 vs 2022



**FIG Total Expenditure –
.28 2021 vs 2022**



The Corporation continued with its momentum to invest heavily in its property, plant and equipment, particularly in its water and wastewater network infrastructure so much so that during the year, the Corporation concluded €8 million worth of water infrastructural projects and €10 million of wastewater network related projects. In addition, the Corporation also added €11 million to its work in progress, implying a year-on-year increase of 12%. The objective behind these capital investments were mainly targeted to replace old and deteriorated main pipes in pursuit to prioritize the quality of water distributed and treated.

The Corporation’s financial outlook for the coming years remains positive yet cautionary, mainly due to interest rates and economic uncertainties driven by externalities. Increases in the

price of raw materials are expected to continue pushing up WSC’s cost base whilst exerting pressure on the WSC’s liquidity due to increased stock holding, considering the security of supply. Performance analyses and control measures remain high on the Corporation’s agenda to the extent that new reporting measures are being launched during 2023 to attribute revenues and expenses to the Corporation’s core functions.

Procurement

Over the past year, the procurement office has remained steadfast in its pursuit of implementing the three-year business plan, bolstering its operational efficiency in processing procurement requests and associated contracts. Throughout 2022,

176 procurement requests were received by the Corporation’s procurement department, with an additional 35 requests carried over from 2021 and fulfilled in 2022. This brings the total number of procurement requests in progress to 221. Of the 221 submissions, 155 were published in 2022, and 131 contracts were awarded, valued at €22 million.

FIG .29 Procurement Requests Handled during 2022 at Publication Stage

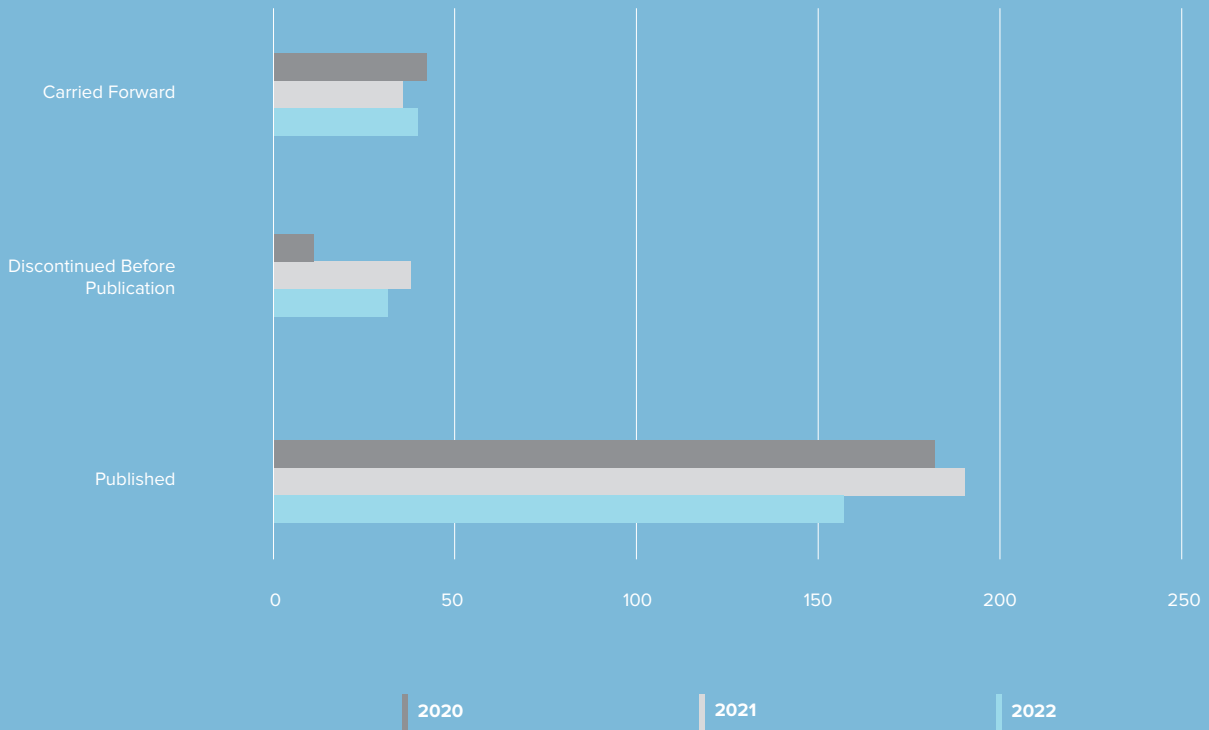
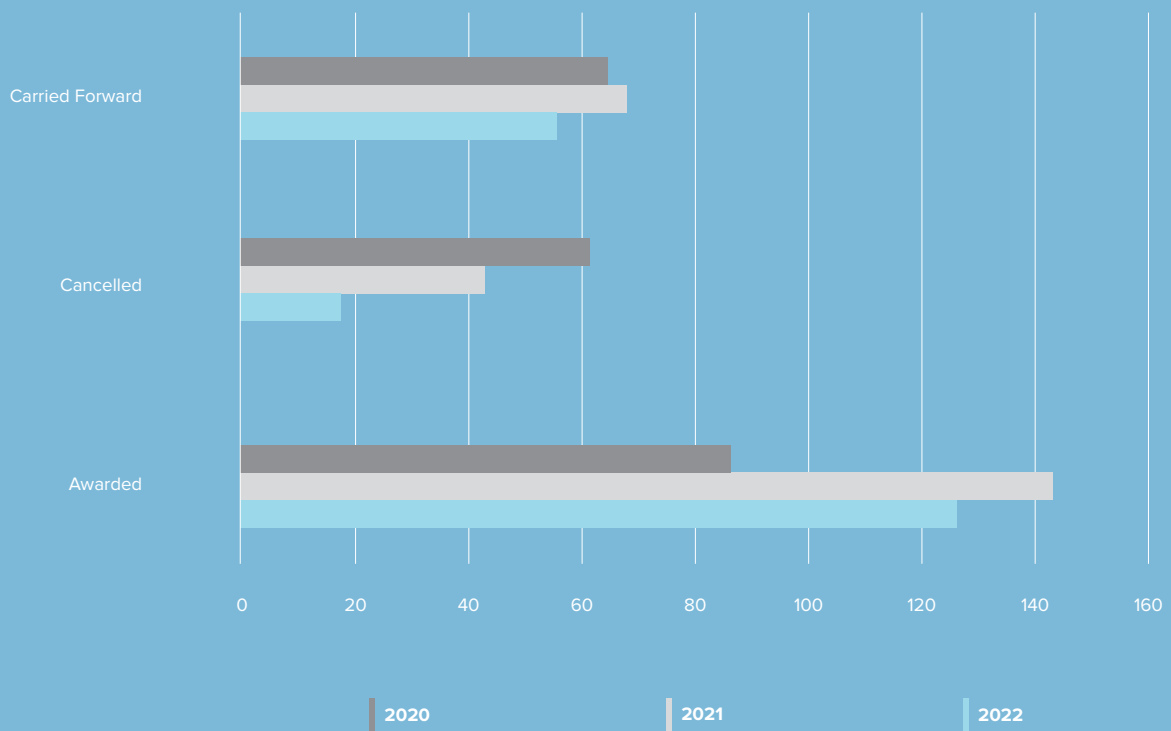


FIG .30 Procurement Requests Handled during 2022 at Award Stage



Of note is the Corporation's successful establishment and utilisation of the Dynamic Purchasing System (DPS) for works tenders in 2022. The WSC's procurement office plans to continue leveraging this mechanism through mini-calls and similar framework agreements to procure critical supplies, decrease the commitment period, hedge against price volatility, and ensure uninterrupted supply chains, even in the face of external disruptions, such as shipping disruptions.

In addition to consolidating policies and procedures to sustain good governance and operational efficiency, the management is committed to retraining employees involved in the decision-making process throughout the procurement cycle. In 2022, we launched a continuous development project for employees directly involved in the procurement process while also launching an online training system for all directorates' convenience.

Regarding warehouse management, the Corporation continued to maintain a zero out-of-stock approach. As a result, the total value of material demand for 2022 amounted to €15.5 million, spread across 2697 stock keeping units (SKUs), representing a 16% increase compared to the previous year. This increase indicates a significant expansion in operations, as demonstrated in Fig. 30 on the opposite page, which depicts the year-on-year change in value and quantity demanded of the ten most highly demanded materials, which together represent approximately 42% in value of the total demand for the year.

Despite the increase in demand and supply chain disruptions resulting from the Russia-Ukraine conflict, the Corporation managed to maintain adequate stock levels to ensure that all

projects continued uninterrupted.

In 2022, the construction of new warehouses in Bulebel gained significant momentum, with the infrastructure nearing completion by the end of the year. Procurement mechanisms for internal services and finishes were published, while those for shelving and equipment are in their final stages before publication. The Corporation aims to complete this project by the end of 2023, consolidating several storage facilities and ensuring that the Corporation's stock is secure.

Human Resources

In response to the pandemic-induced challenges faced in previous years, the Human Resources department's foremost objective for the year in review was to enhance employee engagement through various measures while concurrently emphasising the need for increased automation and efficiency.

Consistent with its three-year human resource strategy, the Corporation implemented a comprehensive roll-out of its new uniform line, emphasising catering to its staff's unique requirements. The Corporation procured the highest quality material and tailored the uniforms to meet the diverse needs of employees across

various fields, ranging from administrative to technical grades. As a result, the new uniforms have elevated the Corporation's corporate image and conferred a more professional appearance, especially for our customer-facing employees.

Another pivotal aspect of the Corporation's engagement strategy was the critical need for agile and open communication channels. To this end, the Corporation installed 14 centrally-controlled monitors across all WSC peripheral sites, allowing for the effective and efficient distribution of internal policies and company-wide correspondence, ensuring a 100% reach amongst our employees. Furthermore, to promote the newly launched employee portal and fully digitalise human resource processes, all employees were provided with a corporate email account, resulting in an impressive 85% uptake by year-end.

As of December 31, 2022, WSC had an active workforce of 1030, resulting in 1,893,132 productive hours. Remote work accounted for 6% of the productive hours, while female employment increased to 18%. The demographics of our employment by area of employment are provided in Fig. 31, while Fig.32 illustrates the breakdown of employees by area of employment.

FIG .31 The Corporation Demographics, as of 31 December 2022

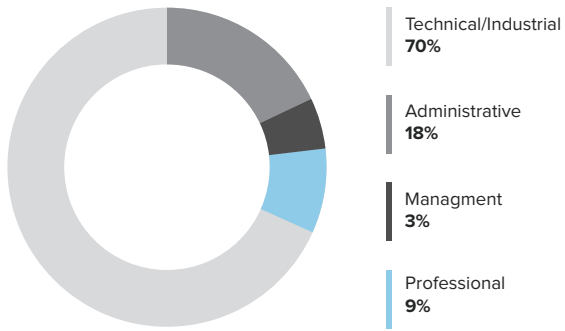


FIG .32 Employees' Gender



FIG .33 Average Age, 2021 vs 2022

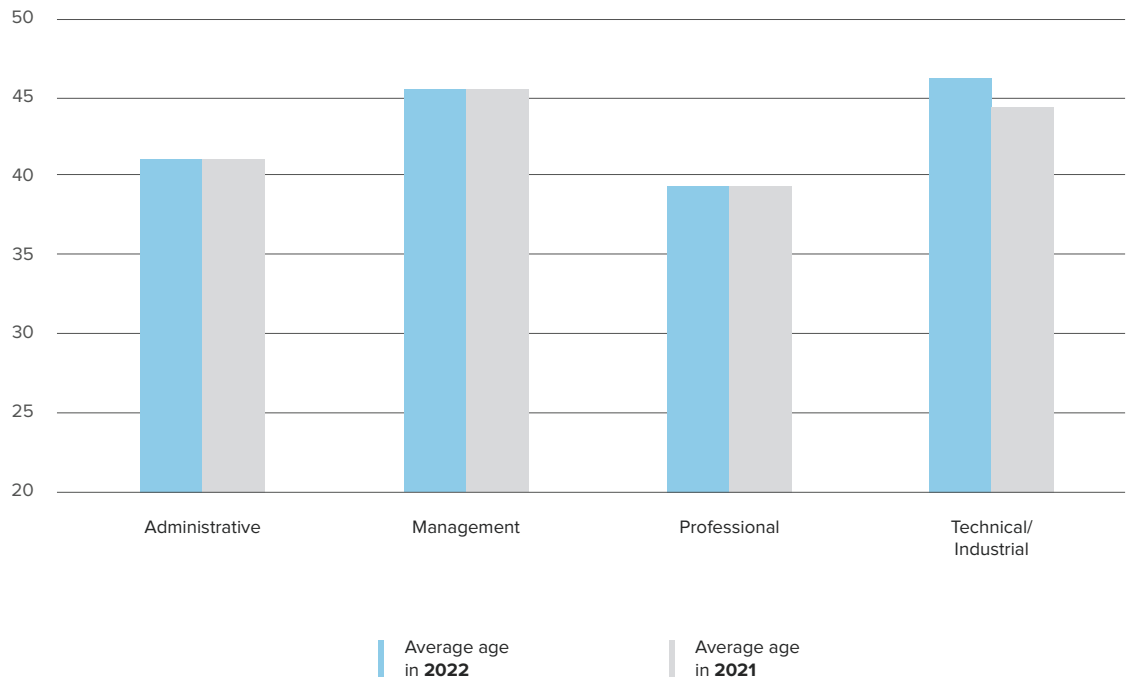
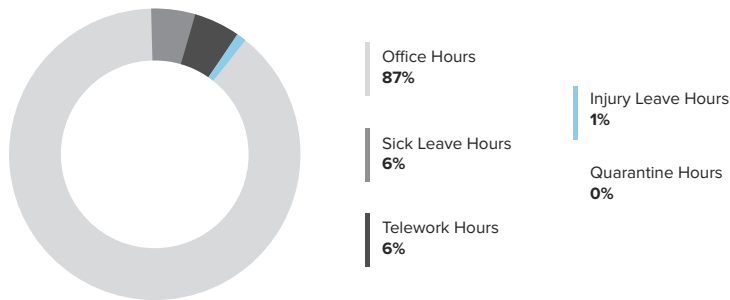


FIG .34 Distribution of Productive Hours in 2021



Throughout 2022, the Corporation issued 53 calls for applications, resulting in 116 career growth opportunities, equating to 11% of our employees improving their position. This was in line with the Corporation's three-year HR plan, which aimed to address lower-scale growth in preceding years and focus more on addressing highly technical and professional roles in the year under review.

In the upcoming year, the Corporation intends to continue enhancing employee engagement through various measures while finalising the Human Resource Information System (HRIS) to automate processes and increase efficiency across the board.

Business Development

In 2022, the Water Services Corporation, through its subsidiary, Clearflowplus Co. Ltd., continued to provide laboratory, IT, water dispensing, and waste management services. The Corporation also maintained and installed RO plants in various hotels around Malta.

As part of its sustainability initiatives, the Corporation installed 40 WAW multi-point water dispensing units in schools in 2022. Following these installations, most public schools in Malta and Gozo now have access to potable water of higher quality, leading to a significant reduction in plastic waste, estimated to have saved 3.8 million plastic bottles from our environment.

During the year under review, the Corporation commissioned one industrial RO, with another completed for commissioning in early 2023. Additionally, a second RO is scheduled to be commissioned later in 2023. This increased activity compared to 2021 has led to a remarkable 54% increase in revenue, amounting to Euro 2 million. Furthermore, the gross profit generated by these services increased by 39%, reaching 0.78 million in 2022.

In 2023, the Corporation is committed to increasing indoor water dispensing units in various public spaces, including the Mater Dei Hospital. In addition, to improve drinking water accessibility, the Corporation plans to install other outdoor installations and participate in activities to promote the reduction of single-use plastics through its subsidiary.



Distribution and Metering

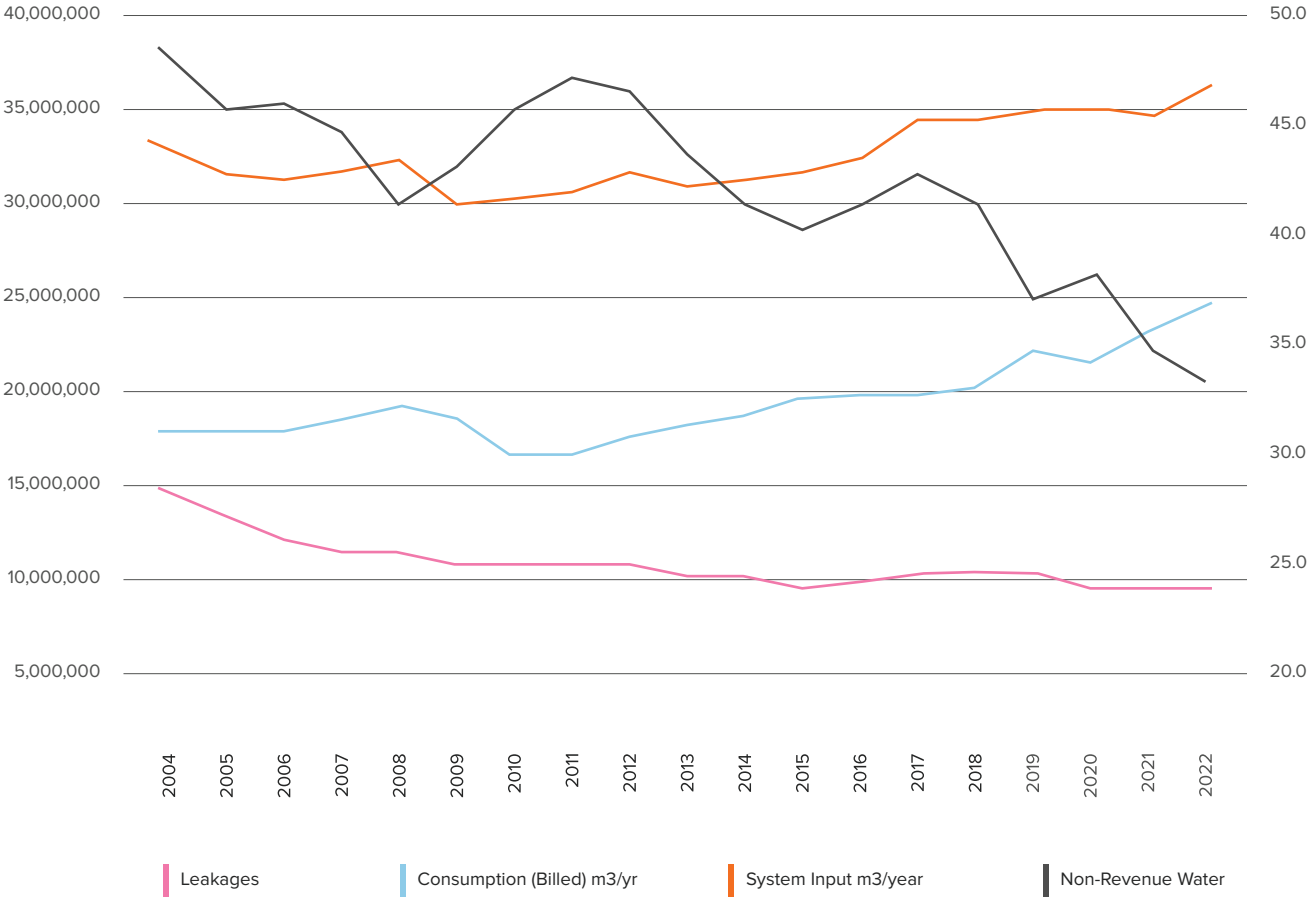
Non-Revenue Water – A Joint Effort by the Regions, Metering, and SI Teams

Non-Revenue Water (NRW) is arguably the most critical indicator that reflects the overall efficiency of any water utility. Over the last five years, this figure has shown a continuous decline. We are proud to report a significant reduction from 35.9% in 2021 to 31.5% over the reporting year alone, following a high of over 43%. Achieving this milestone required significant investments, with a focus on the two primary components that matter the most: Real and Apparent losses.

Real loss, consisting of leakage, has been maintained at a low level. In contrast, apparent losses, particularly related to more accurate billing, have led to an overall improvement of 4.4% over the preceding year. With real losses already close to the minimum acceptable level, our strategy now focuses on the Apparent Loss Index (ALI). In addition, we have incorporated tools and methodologies within the regional and metering operations to ensure that our efforts to reduce NRW are directed towards areas that offer the most significant benefits.

The illustration below portrays the increasing trend of water production, coinciding with the economy and population growth of the islands. The actual losses due to leakage are being sustained at a nominal level. At the same time, a considerable improvement in the billing and consumption of water, together with the increase in billing efficiency, has led to a notable reduction in Non-Revenue Water. These trends and figures reflect a promising outlook.

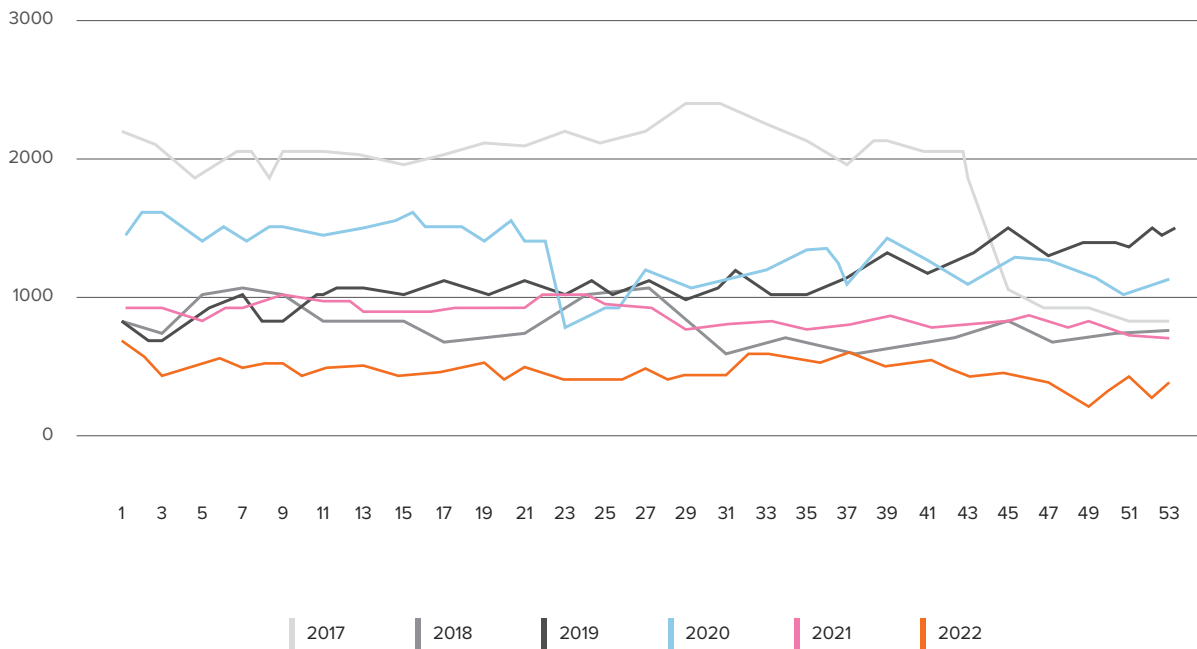
FIG .35 Non-revenue water trend since 2004



The regions have not solely focused on reducing Non-Revenue Water but on enhancing the overall efficiency of the daily operations, despite the persistent daily challenges.

The graph below is a testament to the improvements achieved in maintaining a record low level of pending jobs within the regions' operations. This gain has been sustained throughout the year. In this way, WSC's unwavering objective of serving our consumers with utmost efficiency and timeliness is being maintained, thanks to the constant monitoring facilitated by Business Intelligence tools and the timely tactical adjustments made as deemed necessary.

FIG Trend showing pending works of a typical region
.36 compared to previous years

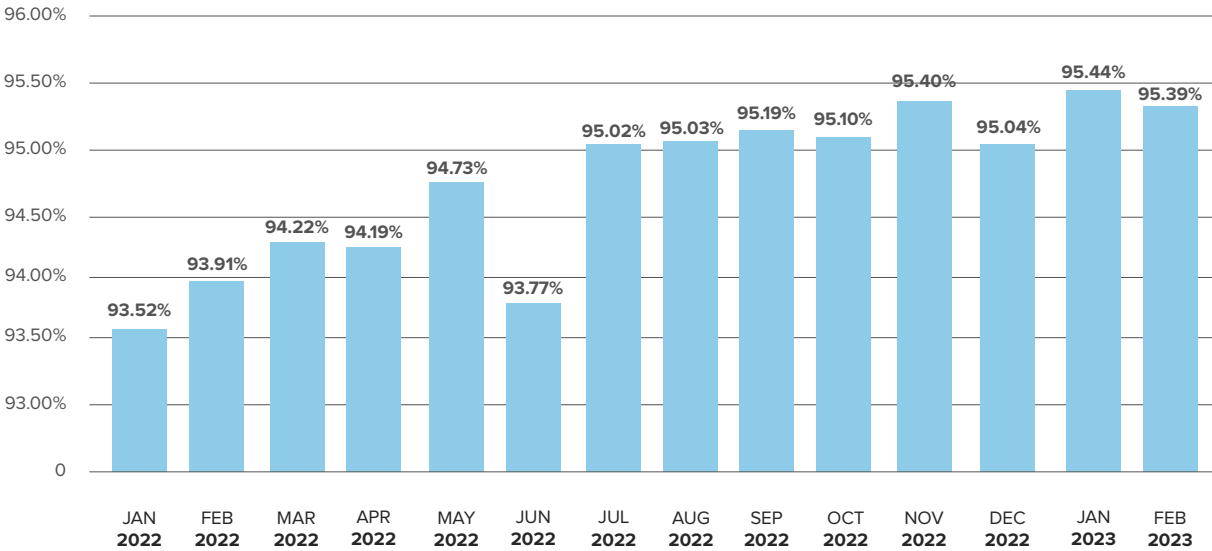


Revenue Assurance

The mitigation of apparent losses related to NRW, which comprises water misuse, meter under-registration, and meter reading/billing anomalies, has been a key focus of the WSC throughout 2022. A working group of employees with diverse skill sets has been established to identify and rectify the problems leading to billing anomalies, ensuring greater billing accuracy. In addition, the metering team, in collaboration with the SI directorate, is working diligently to replace meters with the greatest positive impact on WSC's income. Meanwhile, a proficient back-office team, well-versed in billing procedures, works tirelessly to ensure billing accuracy.

Efficient and accurate water consumption metering is the cornerstone of the revenue assurance department within this directorate. Automated meter management (AMM) effectively enables remote data collection and ensures that the correct data is transmitted to the billing system for timely billing issuance. The receiver layer's ability to capture data sent from the transmitters installed on the billing meters and forward it to the billing engine is a key performance indicator that directly affects this. The graph below illustrates the progress on the receiver layer, with reception rates now exceeding 95% over a 10-day window.

FIG Percentage reached meters .37 over 10 days



The rollout of the AMM is progressing steadily, and the graph below depicts the trend of growing customer base and the installation of AMM systems on 290,823 of our meter population.

FIG Active meters
.38 /month

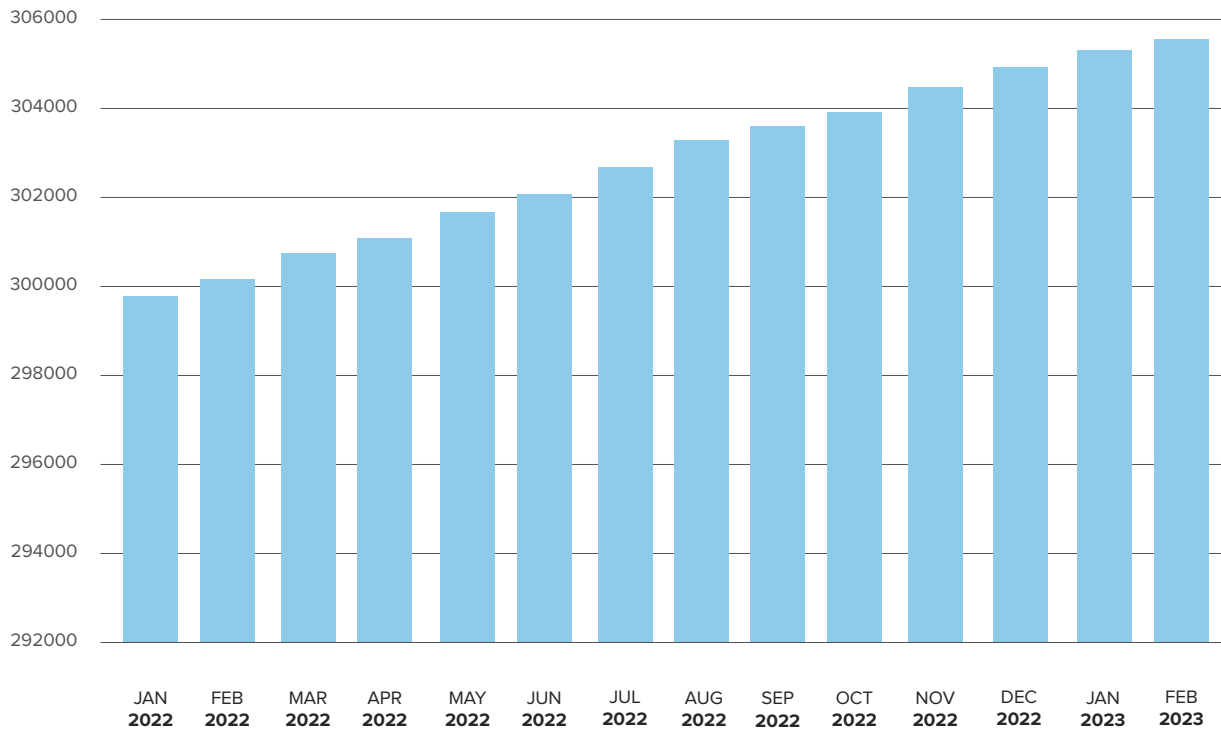
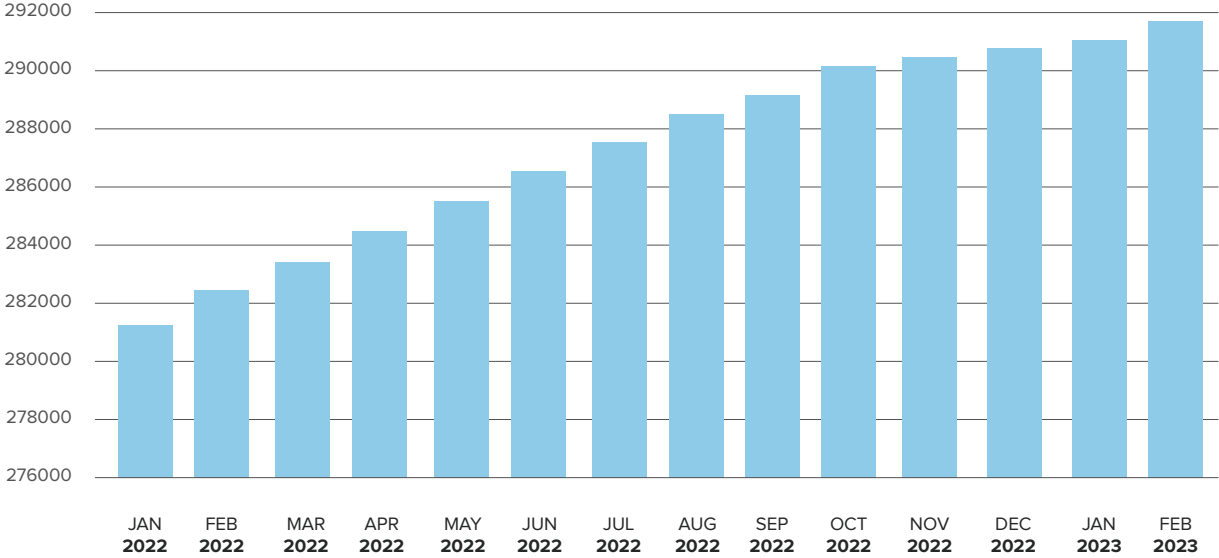


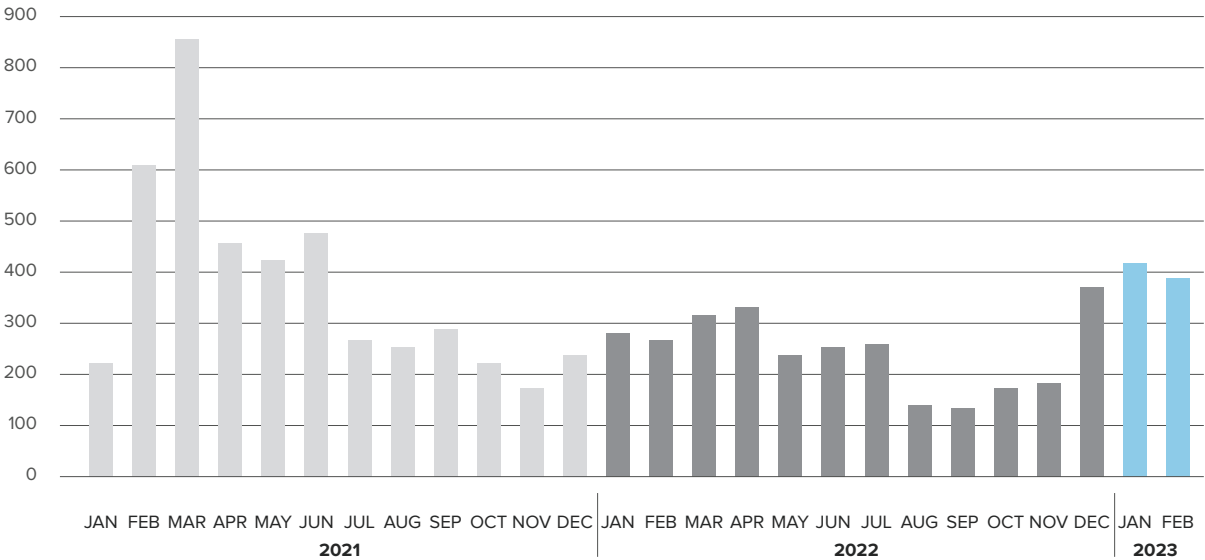
FIG Active modules
.39 /month



Swift implementation usually results in mistakes along the lengthy and complex meter installation process, resulting in billing failures. One such depository for such problems is the BUPF, which can be seen below as being kept well in check over the reporting period.

BUPF (Billing Update Failed) NOTIFICATIONS

FIG BUPFs
.40 /month



Replacing meters is **crucial for maintaining a relatively young meter age**, ensuring the minimum possible under-registration, but consumer profiles complicate the process.

However, as meters age, wear and tear abrasions can adversely affect the sensitivity of the meter mechanism.

Moreover, the combination of roof tanks and low consumption patterns prevalent among the local population could drastically reduce the capacity to register consumption accurately. The graph below illustrates the progress made in replacing

meters over the years. Notably, 2022 has recorded an acceptable number of meter replacements, even though there has been a reduction in the number of meters replaced compared to the previous year. This is because only those deemed essential meters are being replaced. In contrast, older meters that continue to function optimally and measure up to the expected consumption profile of the household size are left in place.

FIG .41 Total number of jobs /year

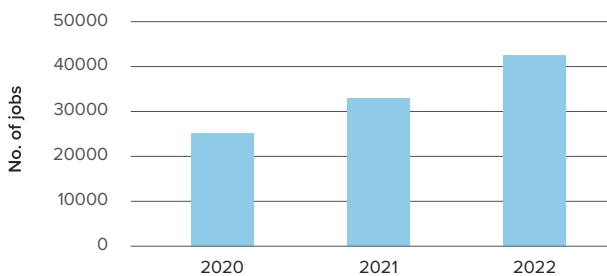
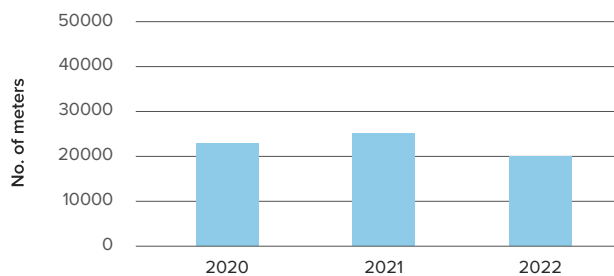


FIG .42 Total number of meters replaced/year



The Department of Accounts Receivable and Administration (DARA) has emerged as a pivotal player in the revenue assurance department, surpassing all expectations with a record-breaking €1.05M in successful billings and

collections during the reporting period. This department is steadily evolving, and WSC is dedicating substantial resources towards bolstering its sections critical to the overall well-being of the Corporation.

DARA – REVENUE COLLECTION

FIG .43 Revenue collected

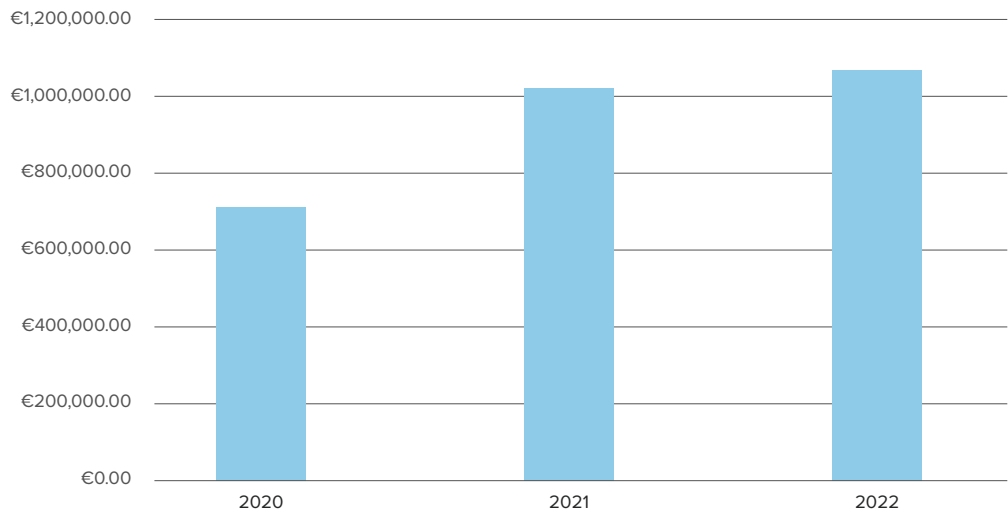
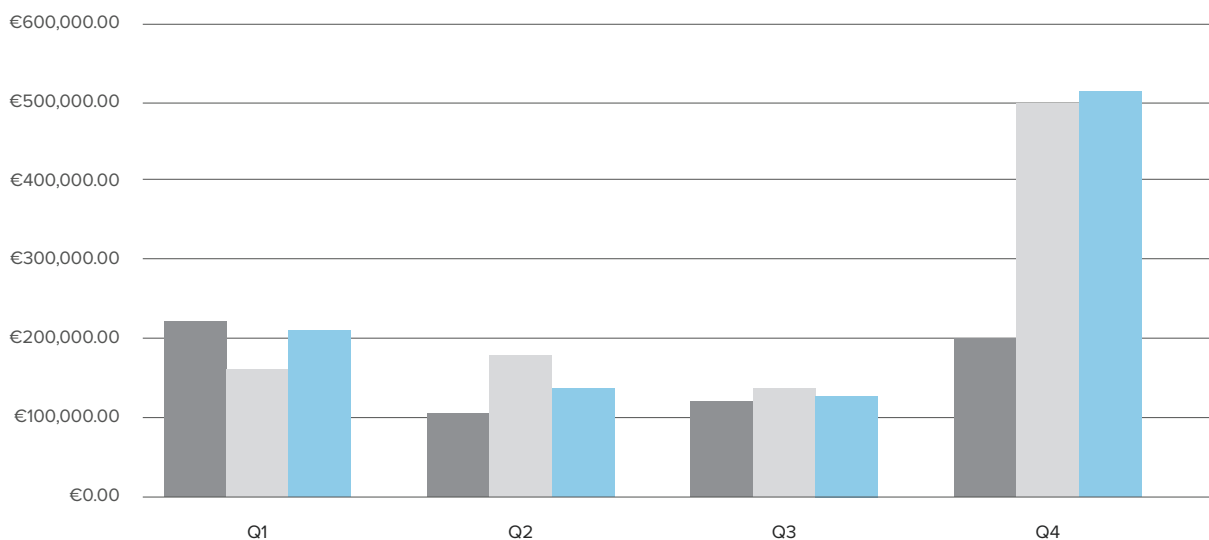


FIG .44 Revenue collected by quarter

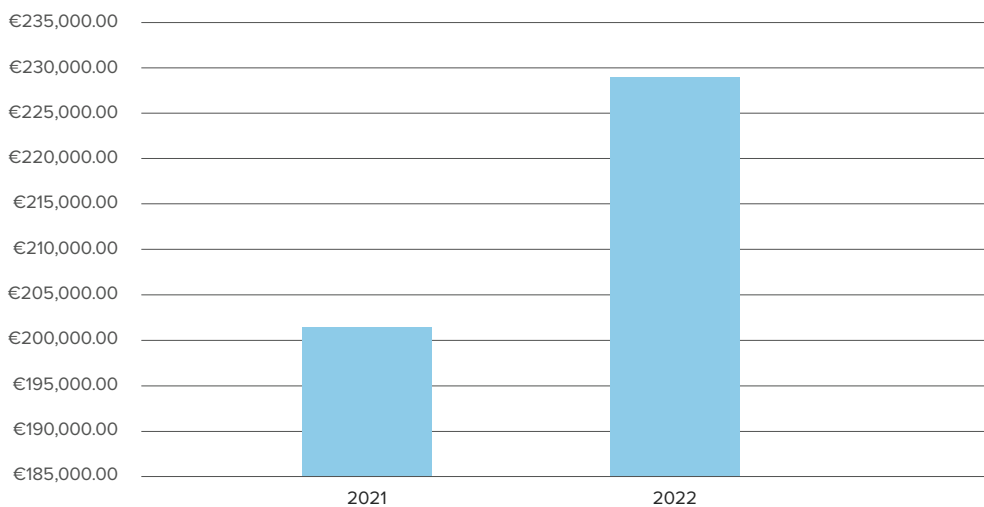


	Q1	Q2	Q3	Q4
2020	€244,875.54	€112,612.10	€151,344.75	€204,155.60
2021	€168,535.29	€176,832.81	€166,571.28	€502,198.22
2022	€218,899.56	€151,169.65	€160,563.11	€524,256.50

The WSC holds a **strong stance against water misuse** and is addressing the same as a high priority.

A dedicated team constantly monitors areas of concern and ensures strict adherence to local laws and regulations. The following graph portrays the significant progress made in 2022 compared to the previous year, with a remarkable 75% increase in fines imposed on tampered meters.

FIG .45 Theft Collection



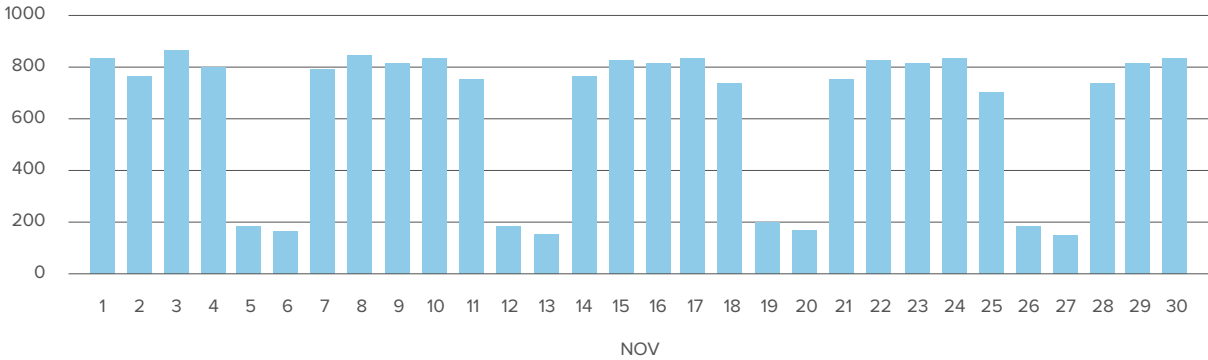
Strategic Information

Strategic Information Network Infrastructure

Upgraded Network Switches

The bandwidth demands and business requirements at the corporate headquarters have necessitated the upgrade of network switches. This upgrade ensures stable, resilient voice and data connections for WSC Users and Visitors. Moreover, the recently installed switches allow the Wireless Infrastructure to function at its peak potential. Each wireless access point's maximum throughput increased to an impressive 5.9 Gbps dual aggregate frame rate.

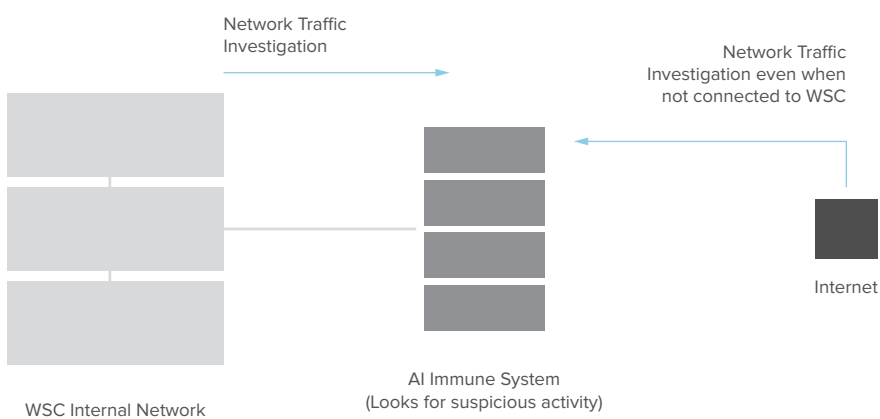
FIG Number of Wireless Clients during
.46 November 2022



Artificially Intelligent Immune System Laptop Sensors

The shift towards remote work brought about by COVID-19 has led to a loss of visibility regarding end-user PCs' behaviour. Considering this, a wise investment was made in specialised AI sensors for portable electronics such as laptops. These sensors now provide the IT security team with complete visibility of corporate devices' activities in any location, and any anomalies may be recorded and investigated.

FIG .47 Diagram showing AI immune system application



SCADA User Interface

Further improvements have been made to the Control Room applications that serve as the focal point of all WSC operations to enhance operational efficiency. The

water and wastewater network alarm system has been modified to improve operator accountability and traceability. Additionally, the SCADA system has been upgraded, and a new comprehensive map of the Maltese Islands has been added to the primary visual display. All data and alarms are now spatially displayed in real-

time, enabling the technical coordinator in the control room to assess them and take necessary action quickly. The tracked data are reverse osmosis facilities, reservoirs, boreholes, pumping stations, wastewater pumping stations and cesspit level sensors.



FIG .48 SCADA User Interface

Software Development

E-Forms

One of our latest technological innovations, the E-Forms management system, has been designed to replace the need for paper forms. This electronic forms designer and deployment application allows users to create and distribute e-forms in line with business requirements within specific departments. The E-form management system offers many features, including the ability to request authorisations, add files as attachments, and output to PDF as required. The system also provides the benefits of an electronic system, including reduced paper usage, no lost paper forms, audited activities, and encryption of all e-documents.

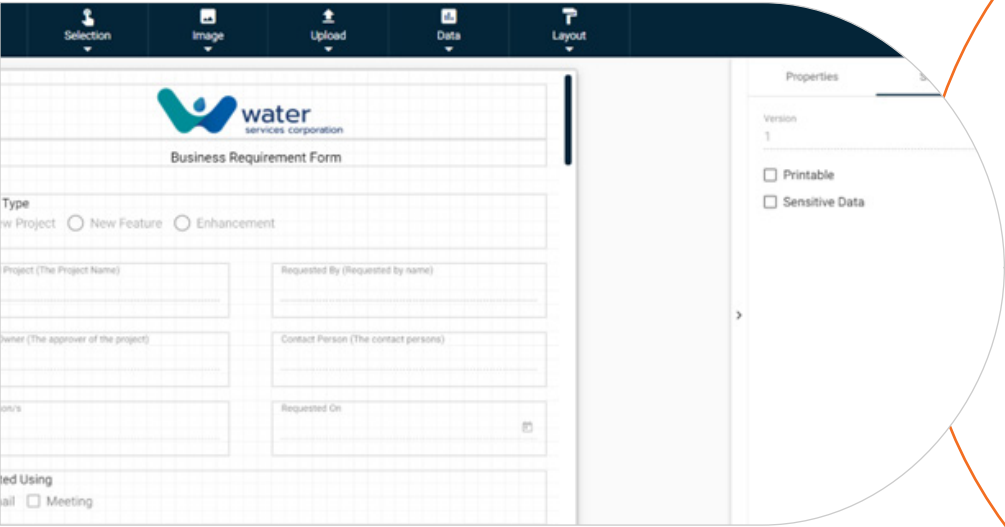
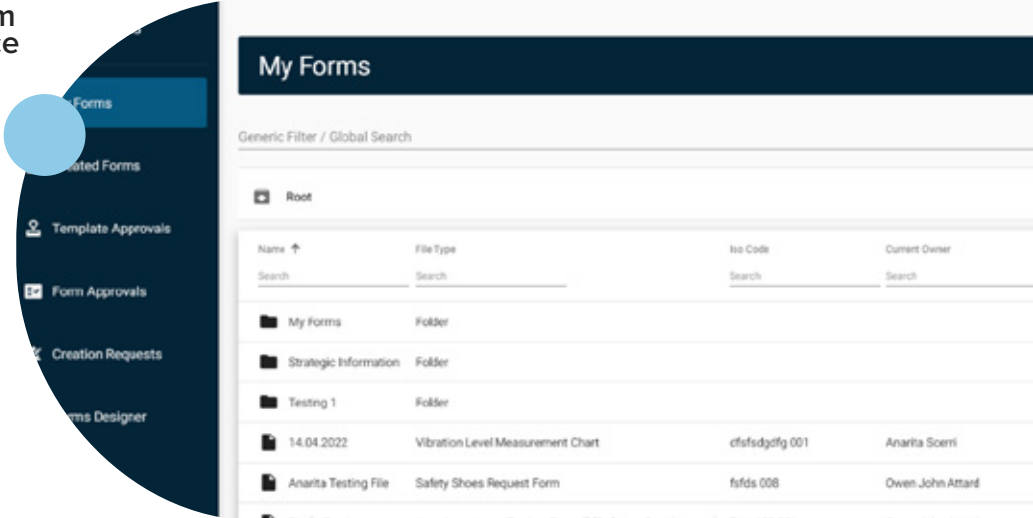


FIG Image showing .49 e-forms designer

FIG Image showing e-form .50 management interface

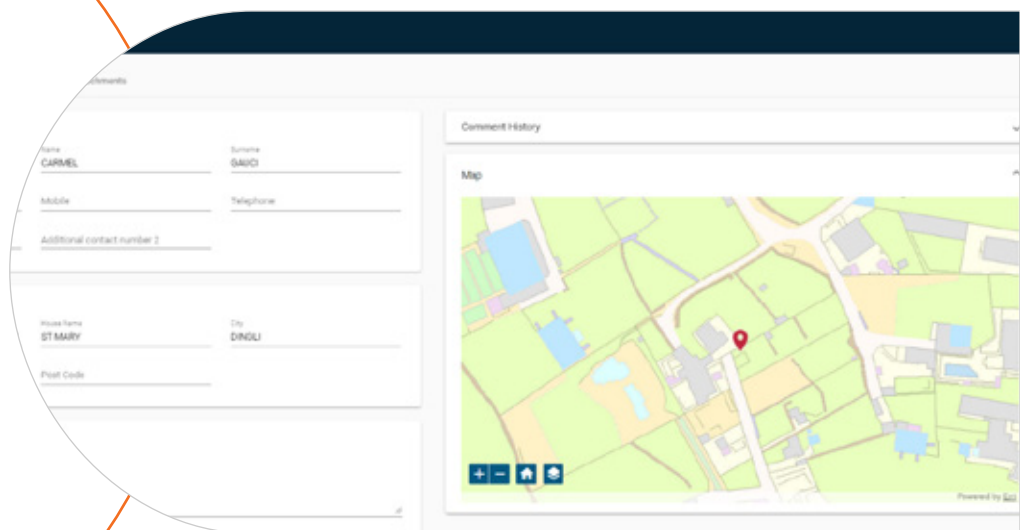


CRMv3

The newly deployed CRM version in the last quarter of the year has enabled customer service agents to contact consumers more efficiently. This was made possible through additional access to updated customer contact data sources.

The new CRM version also has the functionality to generate automated notifications whenever cesspit-related interventions are required, triggering the process of sending out employees to carry out the necessary tasks.

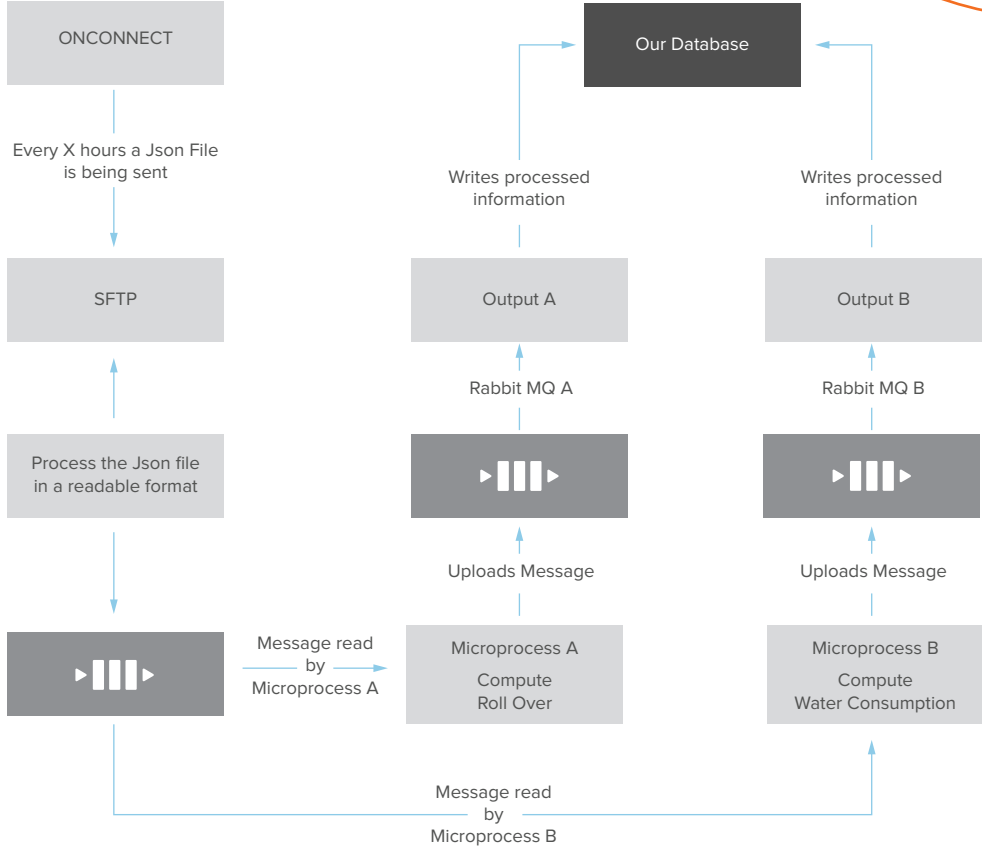
FIG New CRM
.51 Interface



New Meter Data Management (MDM) Infrastructure

During the past year, WSC has invested and deployed the first phase of big data technology to replace the existing system and reap the full benefits of big data technologies. Big data technologies have significantly enhanced and optimised business operations through better performance, particularly when retrieving data for analysis. Through this investment, WSC has a solid foundation to improve meter maintenance, water production and distribution, and provide excellent customer service through effective measures.

FIG 52 New MDM infrastructure



Business Intelligence

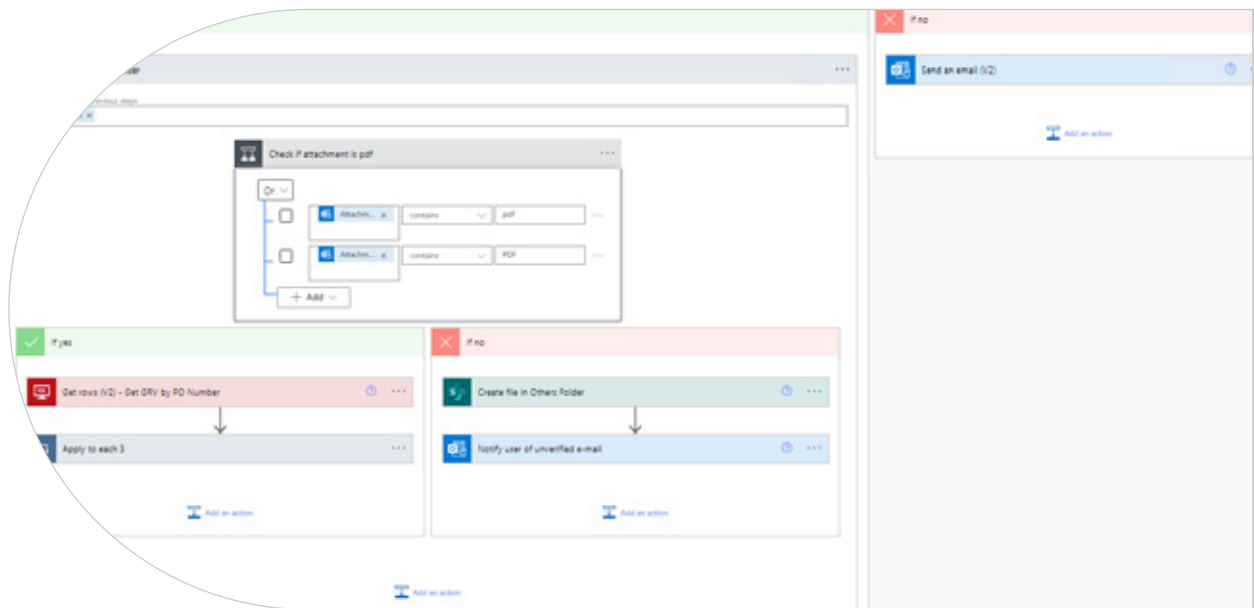
Robotic Process Automation

The successful integration of Robotic Process Automation (RPA) and Microsoft’s Power Automate has revolutionised our data capture capabilities, enabling us to capture data with unparalleled accuracy and speed.

The results are presented in internal and external dashboards, providing a comprehensive overview of our operations. RPA has also eliminated the possibility of human error, while Power Automate has streamlined our purchase order process, reducing manual workload and increasing efficiency. Moreover, our electronic automated data SharePoint repository system has enhanced our record-keeping capabilities, providing a highly organised and easily accessible

document warehouse for all relevant documents. In summary, these innovative technologies have positively impacted our operations, enabling us to optimise our efficiency and productivity, reduce costs, and ultimately achieve greater success.

FIG RPA Data Flow Design
.53



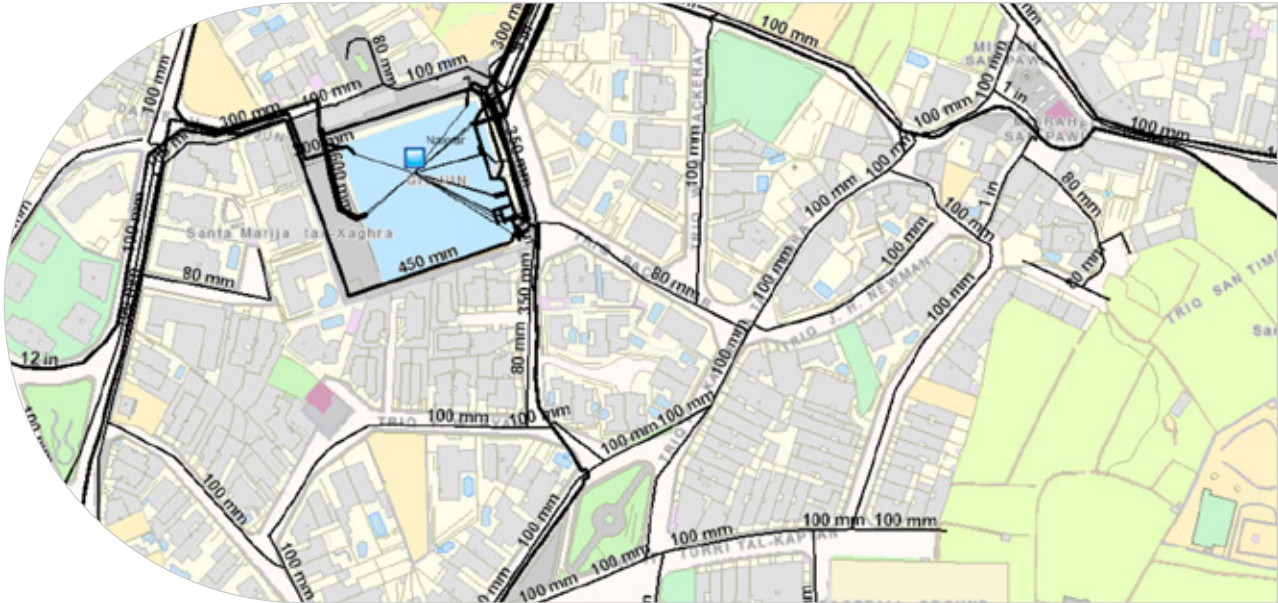
Non-Revenue Water (NRW)

In response to the escalating concern of non-revenue water and our commitment to preventing unnecessary water wastage, we have established a specialised unit dedicated to monitoring and developing intelligent algorithms to safeguard our valuable water resources. Using cutting-edge technology and data-driven strategies, our team has successfully identified and reduced non-revenue water and taken the required action to prevent further loss.

FIG .54 Automatic Consumption computations for NRW operations



FIG .55 Image showing part of the potable water distribution network utilized for NRW calculations



Forecast Statement of Comprehensive Income	2022	2023	% Δ Budget 22 vs Budget 23
Sale of Water	73,743,672	77,907,388	6%
Other Revenue	4,943,404	4,837,668	-2%
Government Subvention	19,300,000	20,900,000	8%
Deferred Income Amortization	11,591,039	9,763,066	-16%
Total Revenue	109,578,115	113,408,122	3%
Salaries & Wages	19,218,074	20,543,381	7%
Electricity	(1,845)	(1,724)	(1,535)
Repairs & Maintenance	11,650,103	11,116,364	-5%
Motor Vehicle Maintenance	2,592,608	2,675,328	3%
O&M ROs	687,406	1,239,199	80%
O&M STPs	5,430,000	6,406,600	18%
Other Recurrent Expenditure	3,913,866	3,183,686	-19%
Depreciation	21,773,870	19,936,219	-8%
Net Billing Operations	6,444,000	5,223,000	-19%
Total Expenditure	106,041,464	103,817,650	-2%
Profit before Interest & Tax	3,536,651	9,590,472	171%

Forecast: Capex by Class	2022	2023	% Δ Budget 22 vs Budget 23
Trench	12,217,768	8,588,019	-30%
Meters	2,298,000	2,464,625	7%
New Water	1,640,544	1,482,180	-10%
RO	1,323,054	777,225	-41%
GW	1,176,865	1,469,780	25%
STP	944,208	2,364,663	150%
Strategic Information	1,454,786	132,146	-91%
Corporate Services	2,249,401	2,673,966	19%
TSS	208,042	225,277	8%
Others	5,243,661	8,284,980	58%
Total Outlay: WSC Only	28,756,329	28,462,860	-1%

