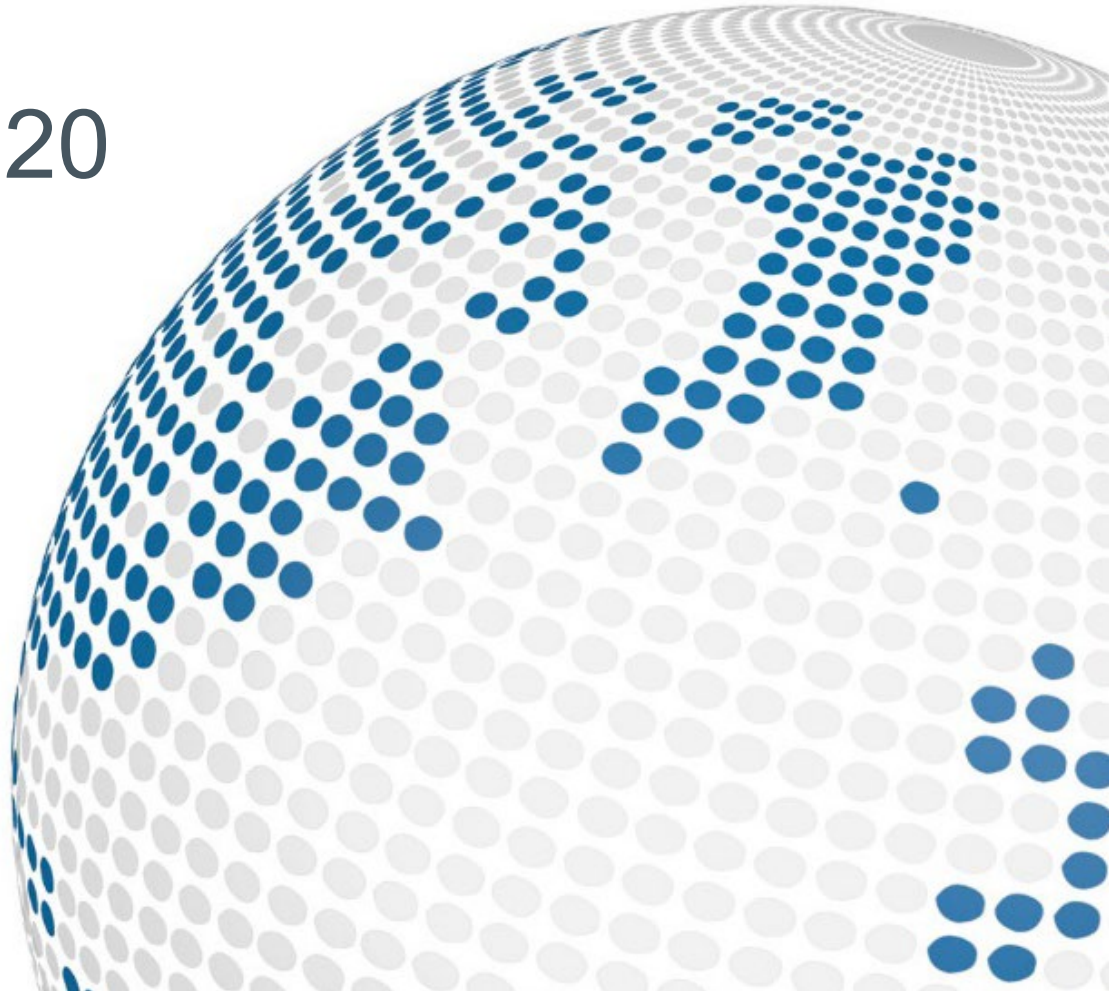
Environmental Performance 2020

Shaping the world with sensor solutions



Marlies Radl

04-2021

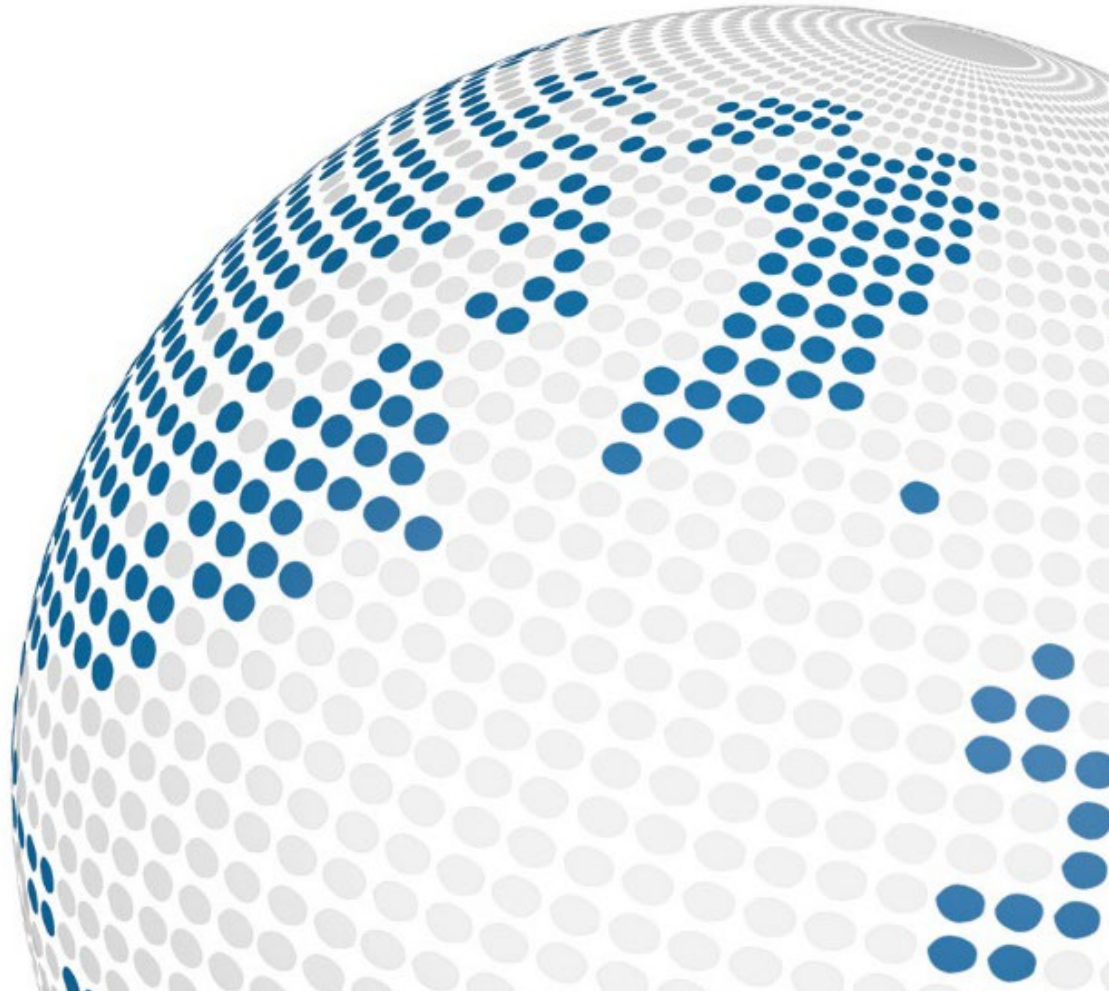
Environment Management

Annual Environmental Performance Statistics

- ams is committed to responsible, visionary environmental management with the aim to contribute to the conservation of an environment worth living in
- ams fully assesses the environmental impact of our business activities and operates in a manner that avoids or minimizes emissions of pollutants and reduces energy consumption
- ams recognizes that human activities are contributing to global climate change therefore we will pursue activities to lessen our company's impact on CO_2 production

The scope of the report in hand is focusing the assessment of environmental impact of the manufacturing sites in Austria, Singapore and Philippines.

Austria

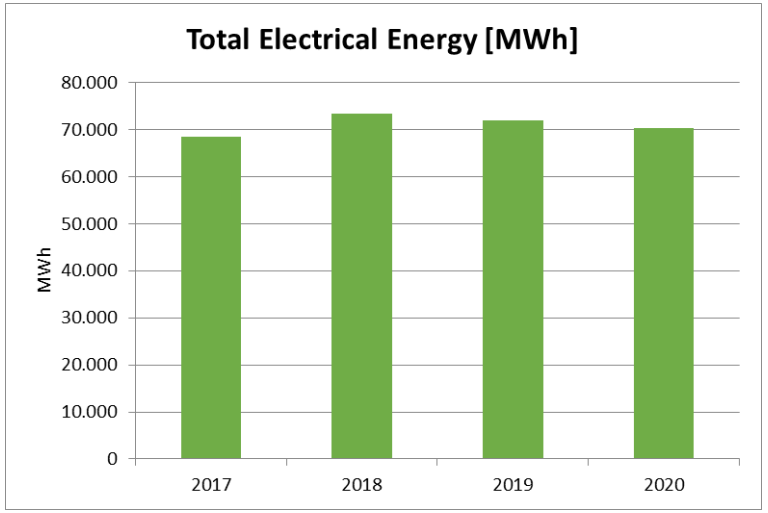


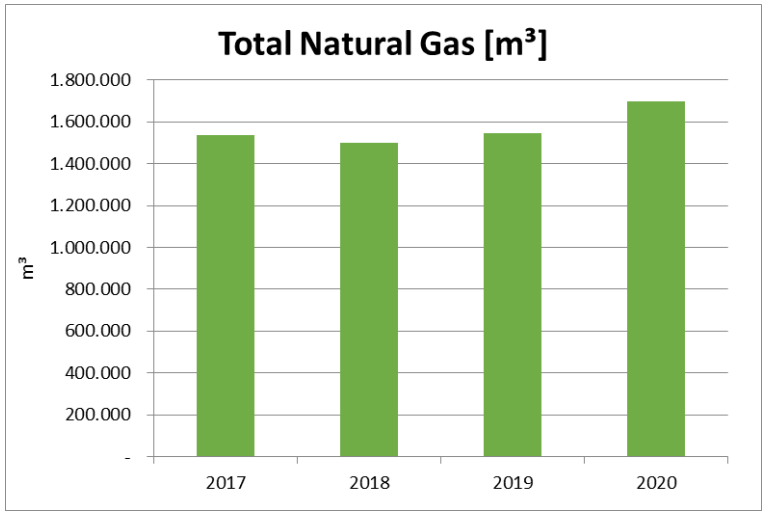
Environmental Performance, Austria

Electrical Energy, Natural Gas in 2020

- **70.327 MWh electrical energy** – decrease by 2,1%.
- The total energy is encompassing the energy needed for administration and offices, the energy required for manufacturing of CMOS and TSV wafer, plus the manufacturing operation in the filter line. In addition the heat pump (consuming electrical energy), which utilizes heat load of equipment to produce warm water.
- 100% usage of renewable electricity, hydropower since 2011.

- **1.696.048 m³ natural gas** - increase by 9,7% due to the temporarily closed down heat recovery system Fab B and fluctuations that are depending on weather conditions.

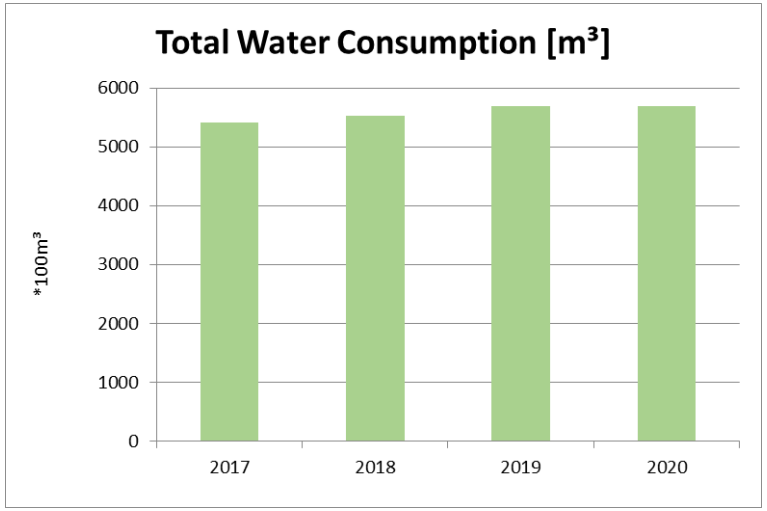




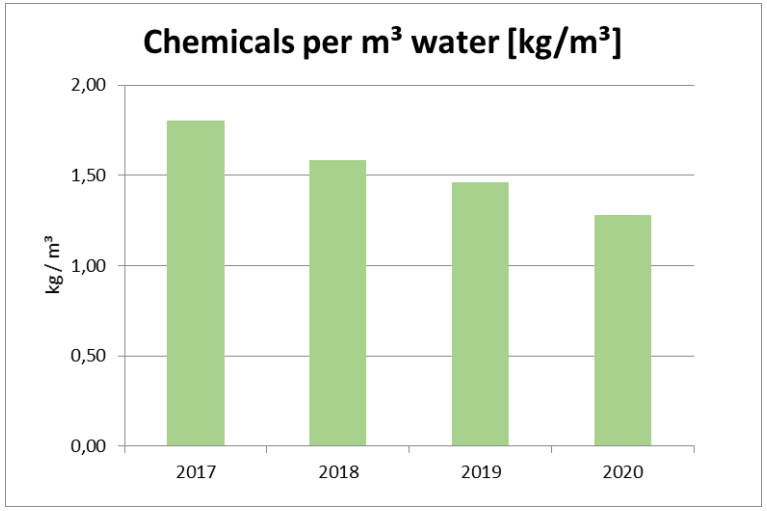
Environmental Performance, Austria

Water, Industrial Grade Chemicals in 2020

- **568.900 m³ water** – decrease by 0,1%.
- Water is used for production of ultrapure water, softened cooling water, and as boiler feed water.



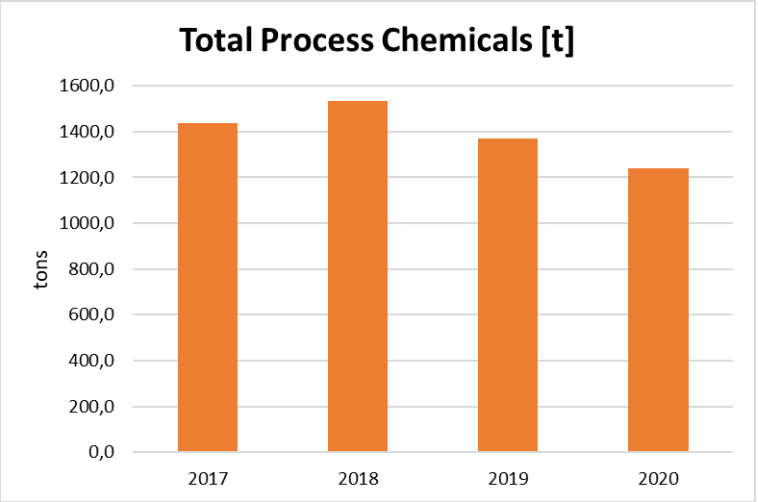
- **1,28 kg/m³ industrial grade chemicals** for water on average – decrease by 12,4% due to water treatment with RO and the usage of waste KOH for waste water neutralization.
- Chemicals for preparation of ultrapure water, for wastewater treatment and exhaust air purification.



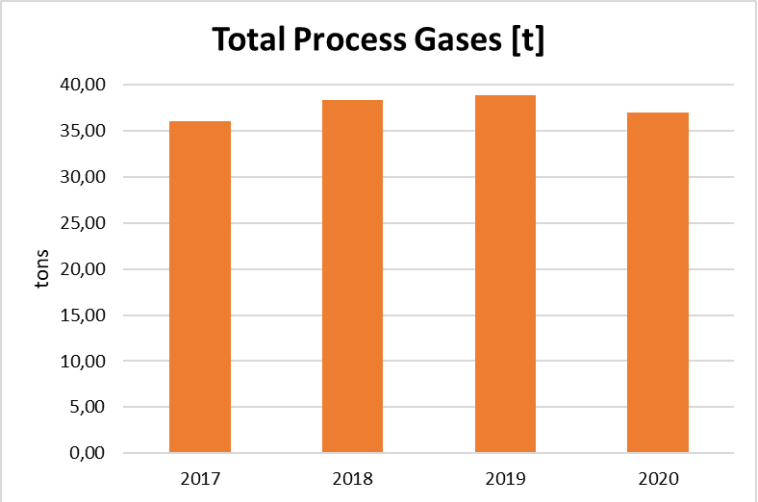
Environmental Performance, Austria

Process Chemicals, Process Gases in 2020

- **1.238 tons process chemicals** – decrease by 9,6% due to process optimization and solvent recycling which results in reduced consumption of solvents.



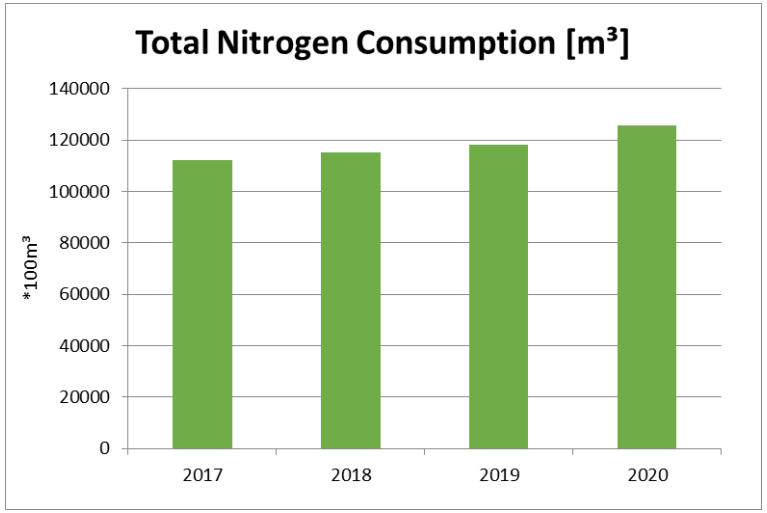
- **37 tons process gases** – decrease by 4,9% due to the mix of production technologies running in the manufacturing line.
- All gases which are consumed for the manufacturing of wafers are considered.



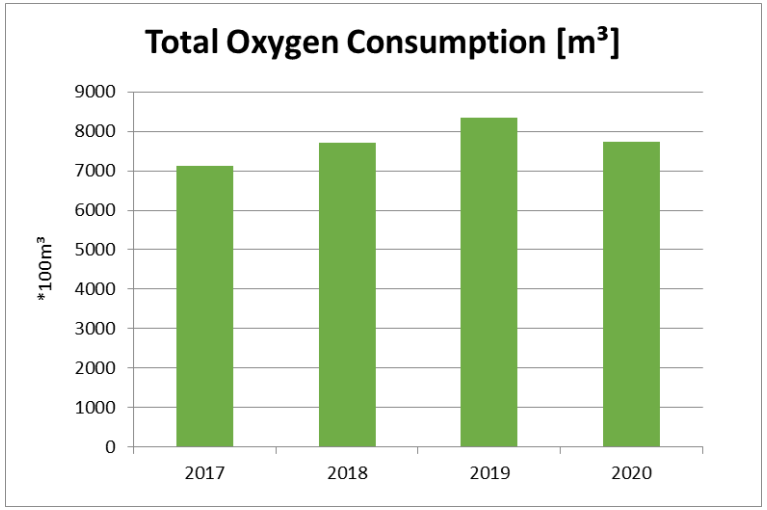
Environmental Performance, Austria

Nitrogen, Oxygen Consumption in 2020

- **12.581.400 m³ nitrogen**– increase by 6,5%.
- Liquid Nitrogen is not only used for production equipment, but also used for maintaining storage conditions.



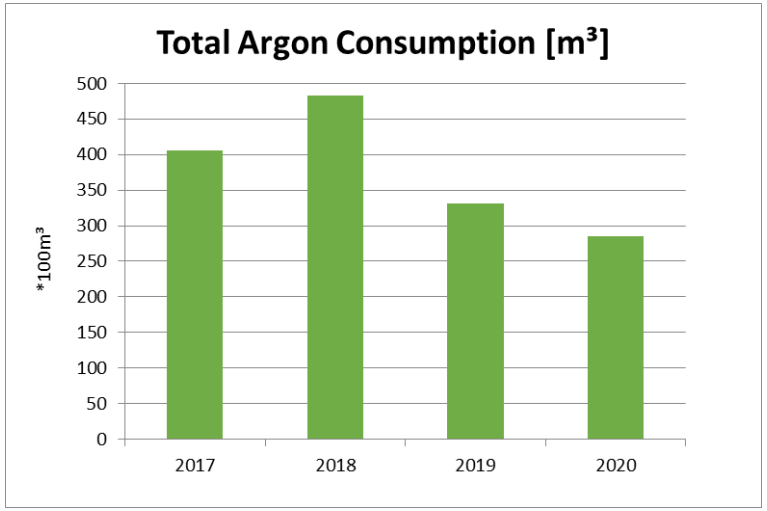
- **774.200 m³ oxygen** - decrease by 7,2% due to the mix of production technologies running in the manufacturing line and filter production.



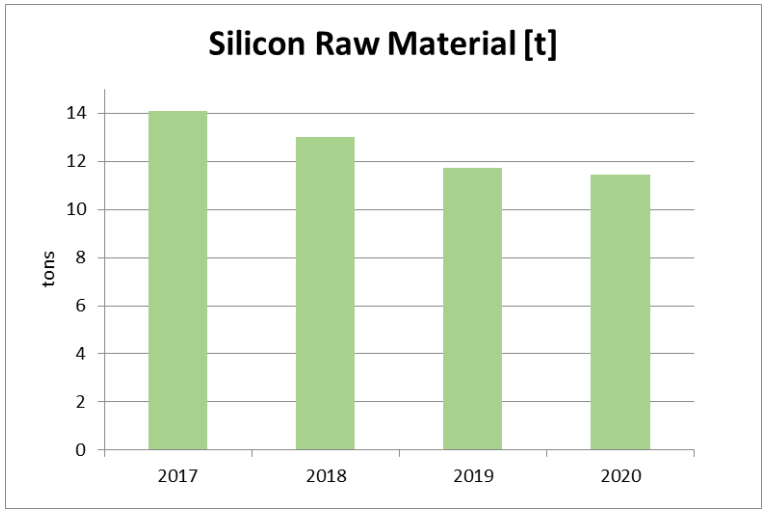
Environmental Performance, Austria

Argon, Silicon Consumption in 2020

- **28.500 m³ argon** – decrease by 13,9% due to the mix of production technologies running in the manufacturing line and filter production.



- **11,4 t silicon** of raw material consumed – decrease by 2,4%, as reflected from production volume.
- Partially, the consumed silicon is from purchased consigned material – already processed wafers from outsourced foundries are purchased, and continued to be processed in ams fabs.

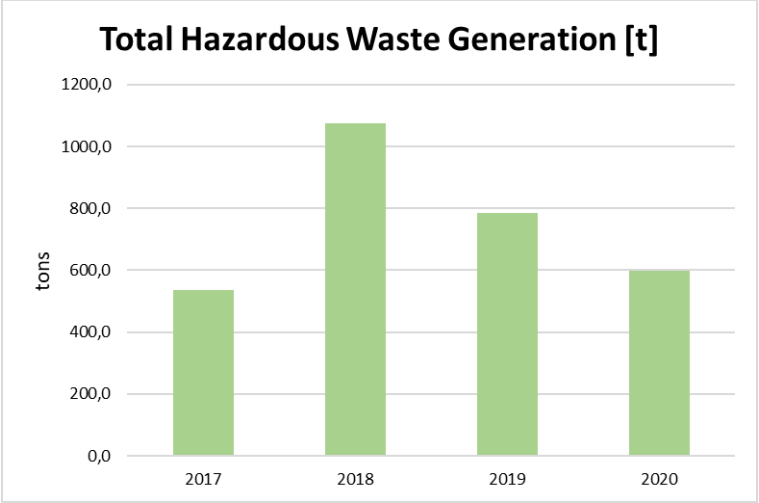


Environmental Performance, Austria

Non-hazardous Waste, Hazardous Waste in 2020

- **218 tons non-hazardous waste** was generated – decrease by 21,5% due to the majority of staff working in home office, and reduced construction activities at the premises (details in the waste management statistics).

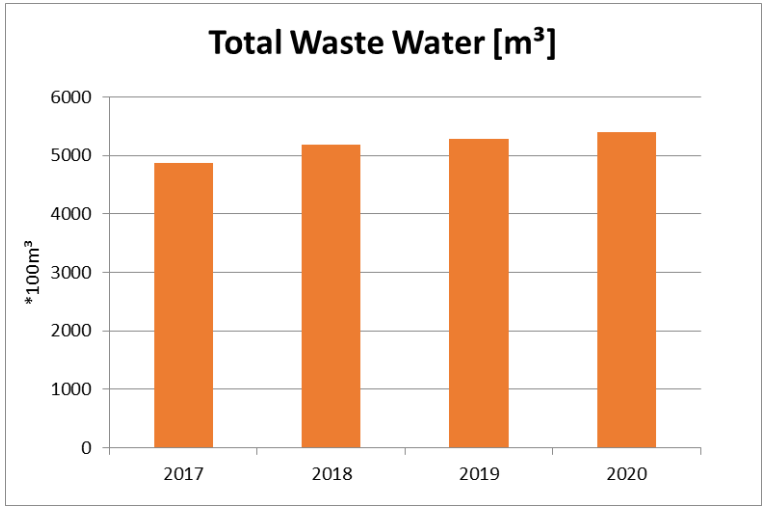
- **597 tons hazardous waste** is generated – decrease by 24% due to the solvent recycling which results in reduced consumption of solvents and relocation of production in ams sites.



Environmental Performance, Austria

Waste Water in 2020

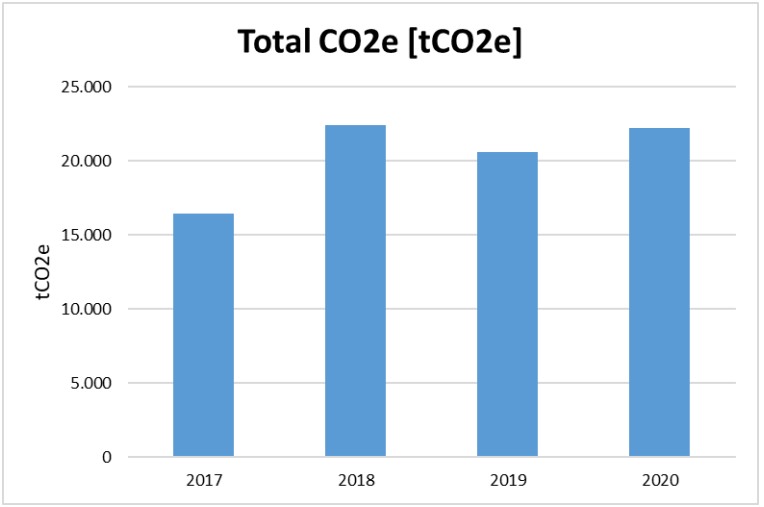
- **540.303 m³ waste water** is generated – increase by 2,1%.

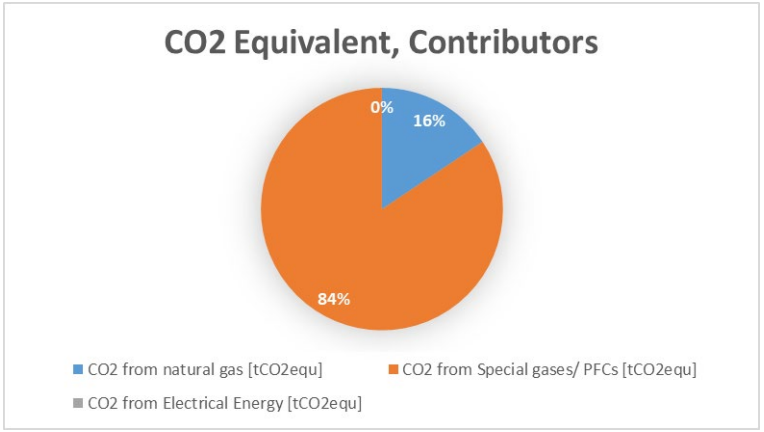


Environmental Performance, Austria

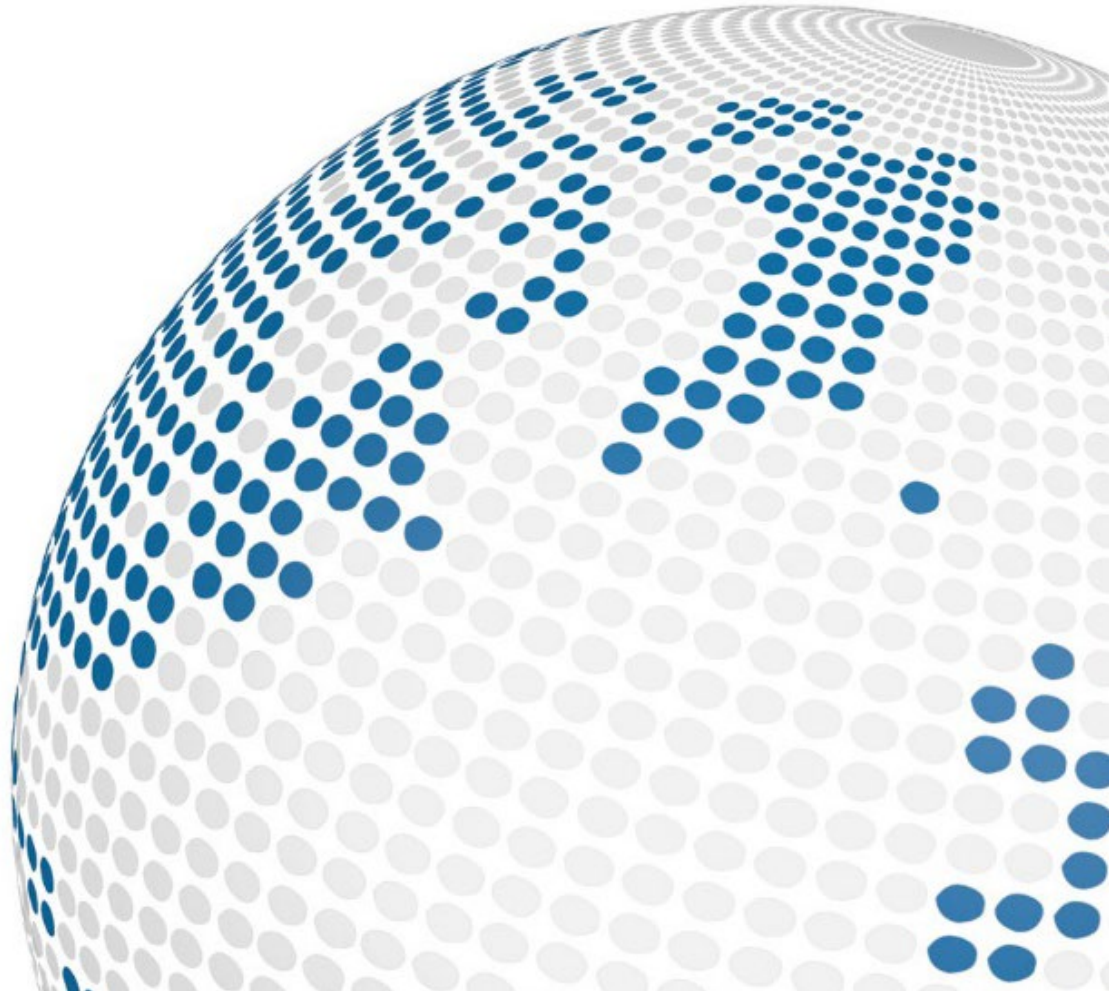
Greenhouse Gas Emissions in 2020

- **22.209 tCO2e** are generated for the site in Austria – total increase by 7,8%. Caused by the use of special gases in the production area that are identified as GHG potential.
- The CO2 calculation is considering the usage of special (production) gases (PFCs, HFCs, SF6, etc) and natural gas.
- 100% usage of renewable electricity, hydropower since 2011 – therefore no CO2e caused.





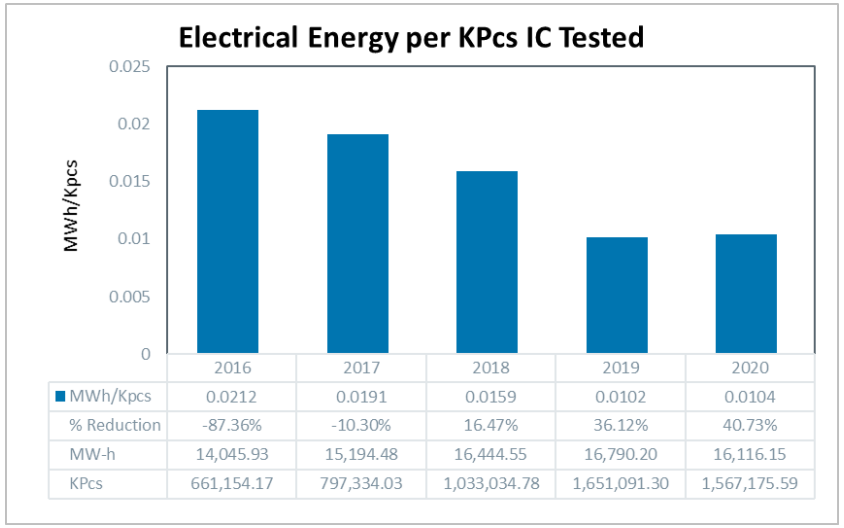
Philippines



Environmental Performance, Calamba

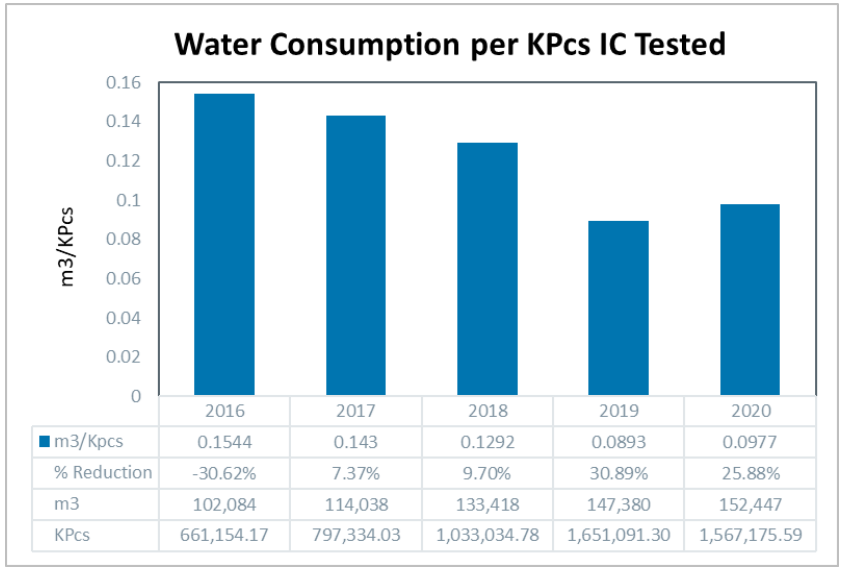
Electrical Energy in 2020

- Average energy used for 2020 was **16,116.15 MWh.** Energy used per production output in 2020 was about **40.73%** of 2019 target.
- Energy consumed was not maximized due to decrease in production output. The total energy still supports facilities operations, test and backend processes, administrative and offices.



	2016	2017	2018	2019	2020
MWh/Kpcs	0.0212	0.0191	0.0159	0.0102	0.0104
% Reduction	-87.36%	-10.30%	16.47%	36.12%	40.73%
MW-h	14,045.93	15,194.48	16,444.55	16,790.20	16,116.15
KPcs	661,154.17	797,334.03	1,033,034.78	1,651,091.30	1,567,175.59

- Average water used in 2020 was **152,447 m³**. Water used per production output in 2020 was about **25.88%** of 2019 target.
- Decrease in production output affects the performance for 2020. Moreover, additional water usage was contributed from regular cleaning and temporary housing of employees during Enhanced Community Quarantine (ECQ) to support COVID-19 control measures.



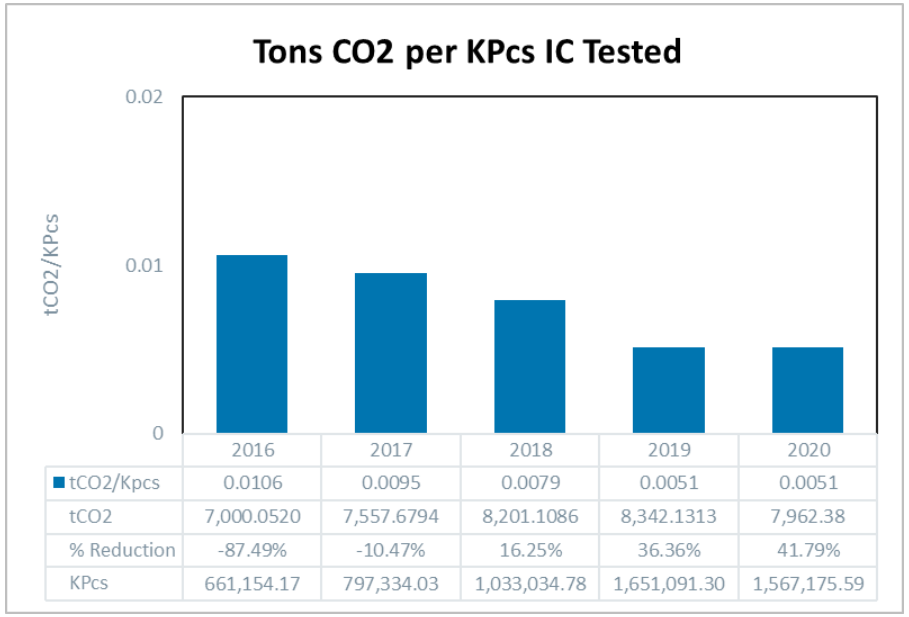
	2016	2017	2018	2019	2020
m3/Kpcs	0.1544	0.143	0.1292	0.0893	0.0977
% Reduction	-30.62%	7.37%	9.70%	30.89%	25.88%
m3	102,084	114,038	133,418	147,380	152,447
KPcs	661,154.17	797,334.03	1,033,034.78	1,651,091.30	1,567,175.59

Note: 2020 target (5% reduction from 2019 actual performance) was adjusted (25% of 2019 target) implemented in August - December. This is to consider the reduced production output due to effect of pandemic which impacts the KPI (normalized by Production Output).

Environmental Performance, Calamba

Greenhouse Gas Emission in 2020

- Total CO_2 emission was **7,962.38**. Calculated CO_2 emission per production output in 2020 was **41.79%** of 2019 target.
- Main contributor for CO_2 emission was use of electricity. However, the calculation considering tested ICs are fairly constant in 2019 and 2020 performance.



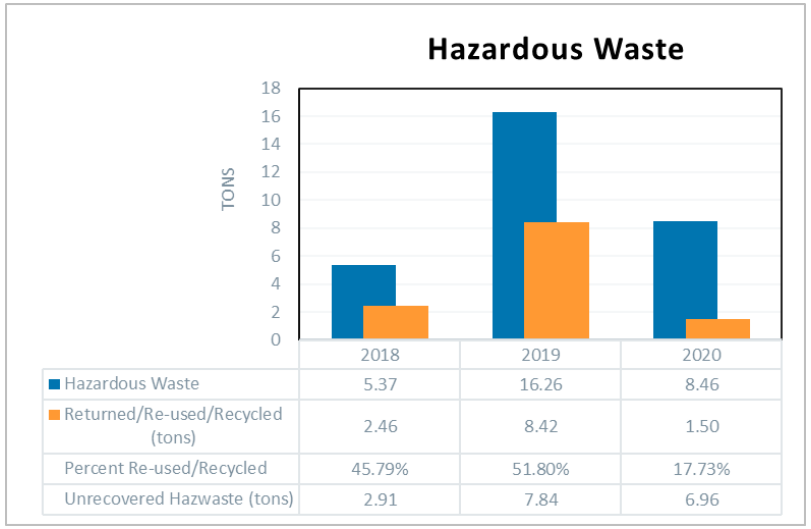
	2016	2017	2018	2019	2020
tCO2/Kpcs	0.0106	0.0095	0.0079	0.0051	0.0051
tCO2	7,000.0520	7,557.6794	8,201.1086	8,342.1313	7,962.38
% Reduction	-87.49%	-10.47%	16.25%	36.36%	41.79%
KPcs	661,154.17	797,334.03	1,033,034.78	1,651,091.30	1,567,175.59

Note: 2020 target (5% reduction from 2019 actual performance) was adjusted (25% of 2019 target) implemented in August - December.
This is to consider the reduced production output due to effect of pandemic which impacts the KPI (normalized by Production Output).

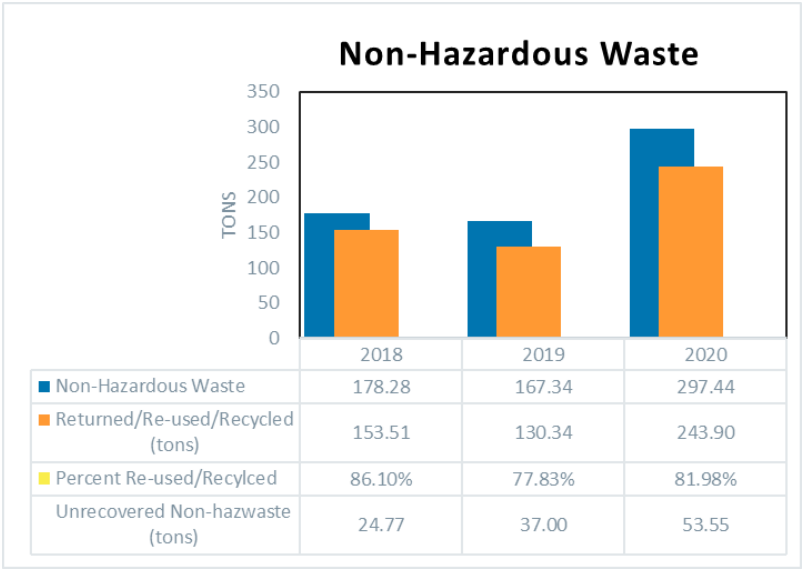
Environmental Performance, Calamba

Nonhazardous Waste, Hazardous Waste in 2020

- Hazardous waste generated was **8.46 tons**. About 17.73% of this volume was reused or recycled. However, based from year to year performance, the hazardous waste that was not recycled/re-used has decreased by 11.22% from 2019.
- The significant decrease on the waste recovery performance was affected by recycling facilities' operations due to pandemic effects and documentation issues.
- Improvement in this topic will include, training for proper handling and disposal of Hazardous Wastes involved employees, and the scouting for treaters that supports re-use/ recover/ and recycle treatment methods within 2021.
- Nonhazardous waste generated was **297.44 tons**. About 81.98% of this volume was reused and recycled. While the tons of unrecovered non-haz waste has increased from 2019, however in terms of percent recovery, year 2020 is better than year 2019.
- Contributing factor on improved performance was due to increase of awareness strengthening the recycling and reused program implementation like internal tray washing activity and segregation-at-source.



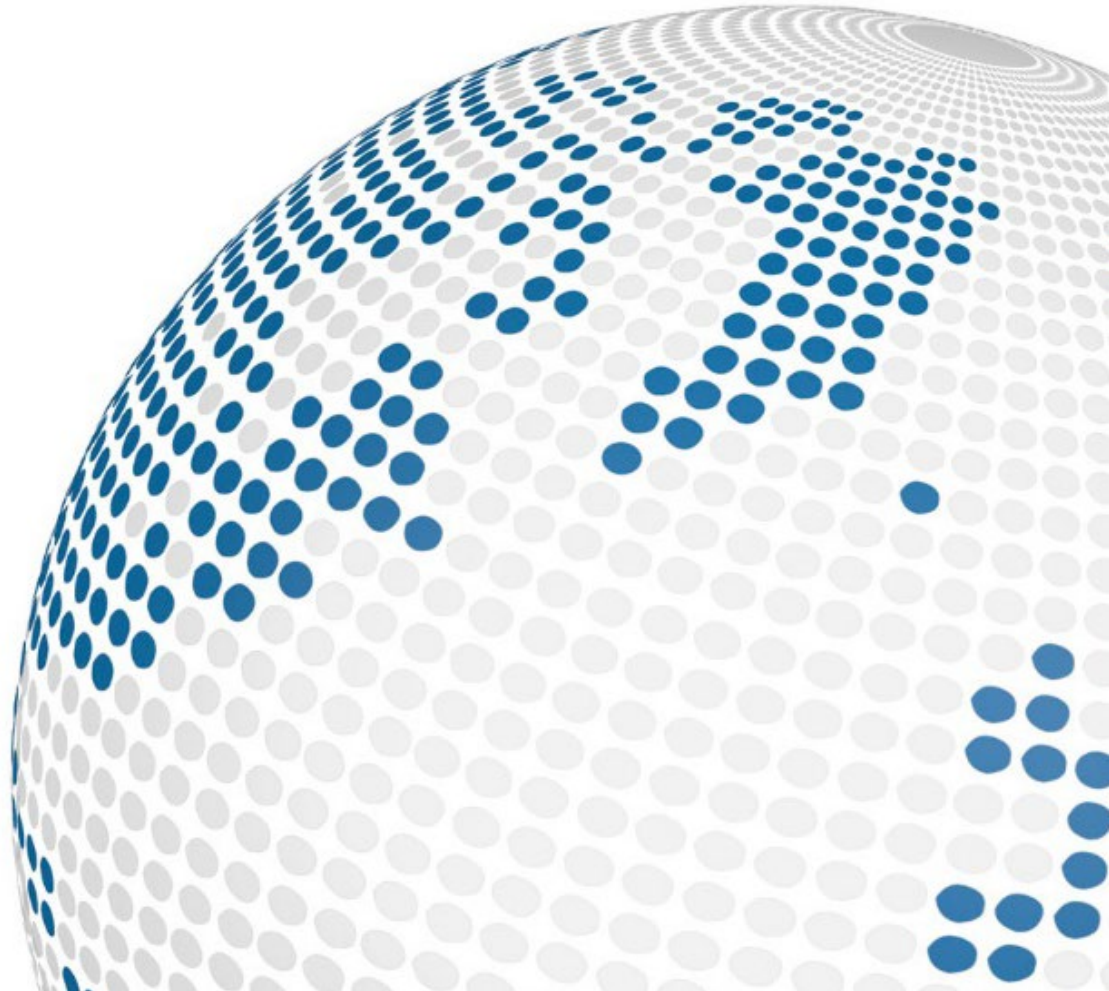
	2018	2019	2020
Hazardous Waste	5.37	16.26	8.46
Returned/Re-used/Recycled (tons)	2.46	8.42	1.50
Percent Re-used/Recycled	45.79%	51.80%	17.73%
Unrecovered Hazwaste (tons)	2.91	7.84	6.96



	2018	2019	2020
Non-Hazardous Waste	178.28	167.34	297.44
Returned/Re-used/Recycled (tons)	153.51	130.34	243.90
Percent Re-used/Recylced	86.10%	77.83%	81.98%
Unrecovered Non-hazwaste (tons)	24.77	37.00	53.55

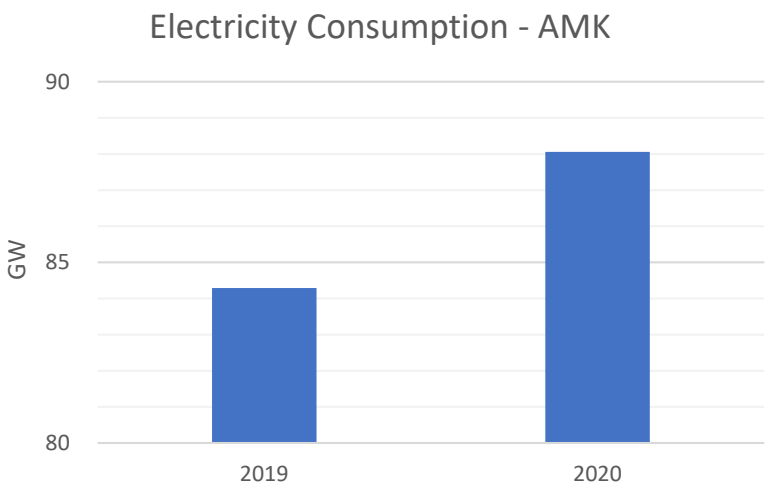
Note: No change in target for both Hazardous and Non-hazardous waste in 2020 because this is not normalized by Production Output.

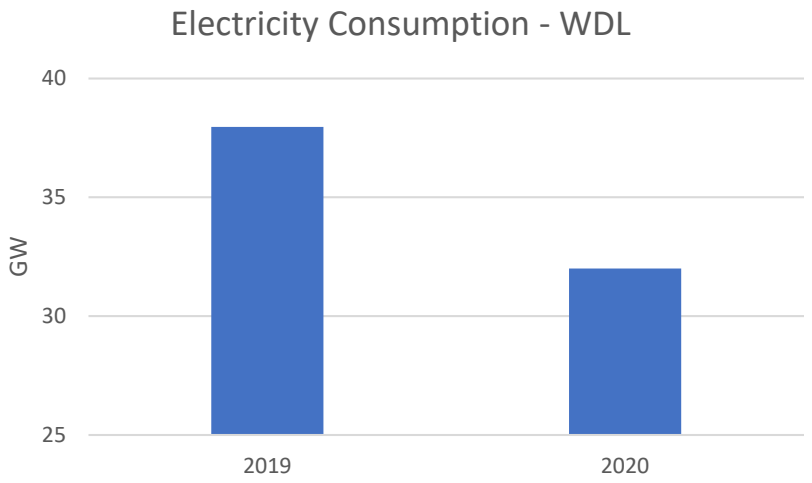
Singapore

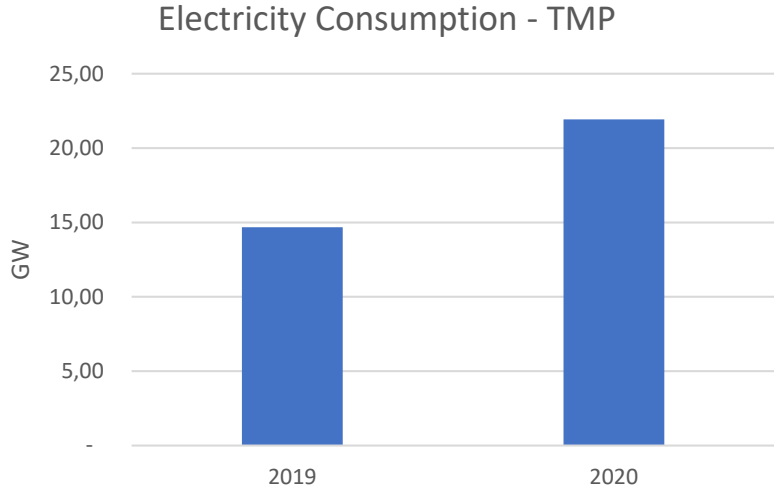


Environmental Performance, AMK, WDL & TMP

Electricity in 2020





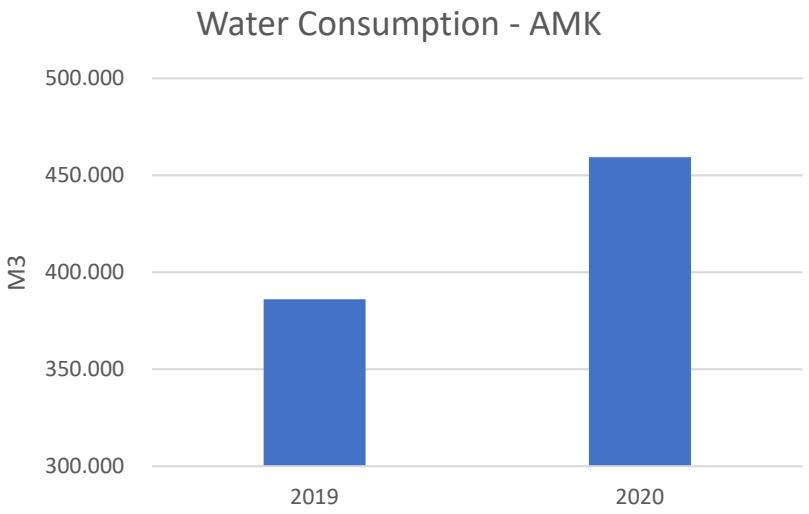


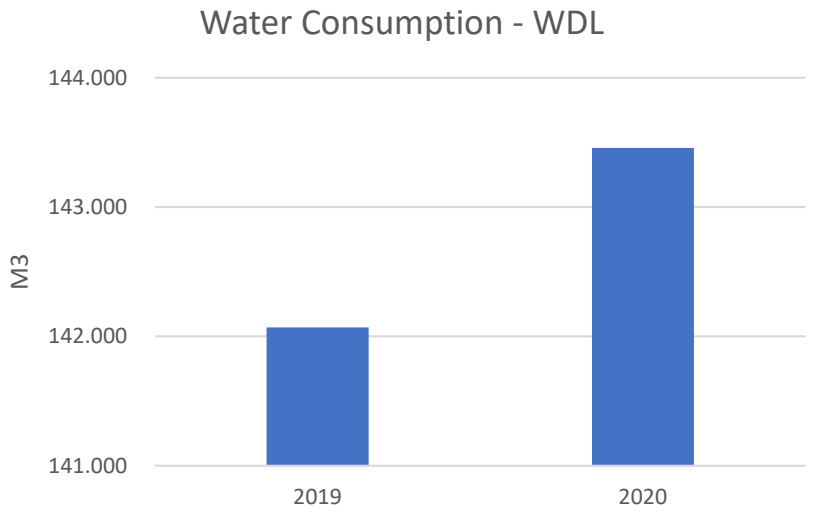
AMK	WDL	TMP
▪ **88.06 GW electrical energy-** increased by 4% ▪ Did not meet the target of 1% reduction due to increased of electricity consumption and it was contributed by the increased of packout volume	▪ **32.01 GW electrical energy-** decreased by 16% ▪ Met the target of 1% reduction, actual reduction is 16%	▪ **22.01 GW electrical energy-** increased by 48% ▪ Did not meet the target 1% reduction due to Increased of electricity consumption and it was contributed by the increased of packout volume

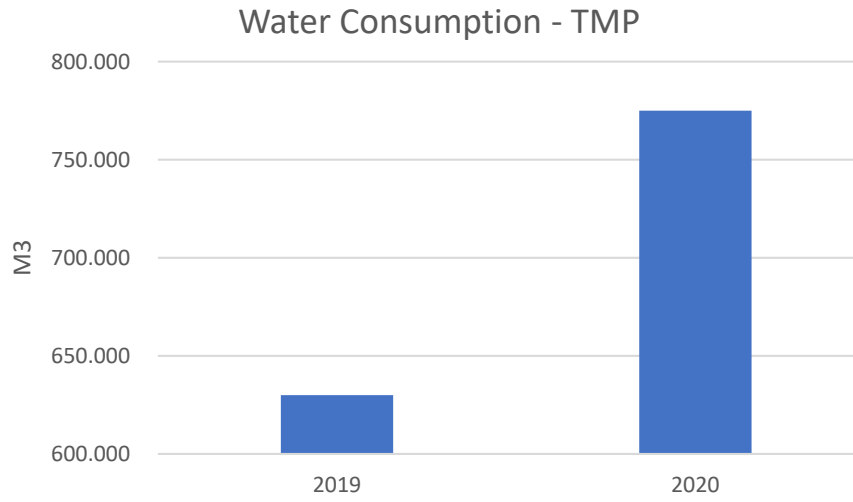
	AMK		WDL		TMP	
	2019	2020	2019	2020	2019	2020
Packout, Mpcs	403	418	333	642	-	-
Packout, Kpcs (wafer)	-	-	-	-	24	41

Environmental Performance, AMK, WDL & TMP

Water in 2020





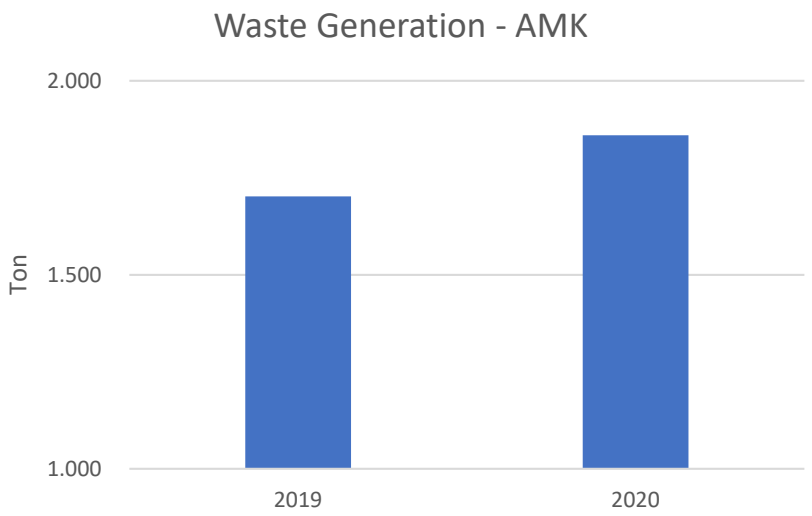


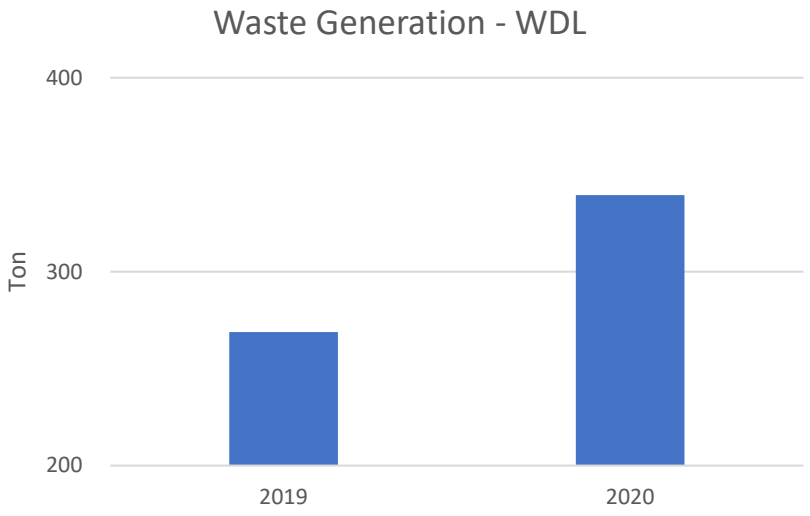
AMK	WDL	TMP
▪ **459K M3 water -** increased by 19% ▪ Did not meet the target of 1% reduction due to increased of water consumption and it was contributed by the increased of packout volume	▪ **143K M3 water-** increased by1% ▪ Did not meet the target of 1% reduction due to increased of water consumption and it was contributed by the increased of packout volume	▪ **172K M3-** increased by 69% ▪ Did not meet the target of 1% reduction due to increased of water consumption and it was contributed by the increased of packout volume

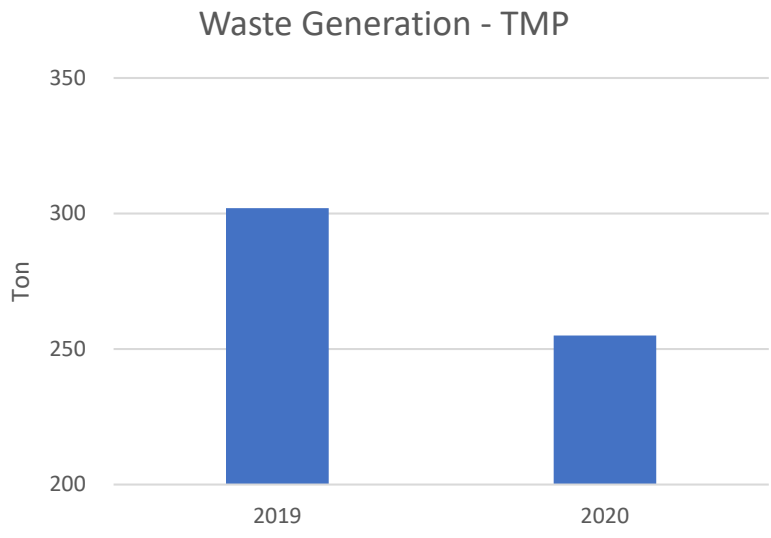
	AMK		WDL		TMP	
	2019	**2020**	**2019**	**2020**	**2019**	**2020**
Packout, Mpcs	403	418	333	642	-	-
Packout, Kpcs (wafer)	-	-	-	-	24	41

Environmental Performance, AMK, WDL & TMP

Waste in 2020





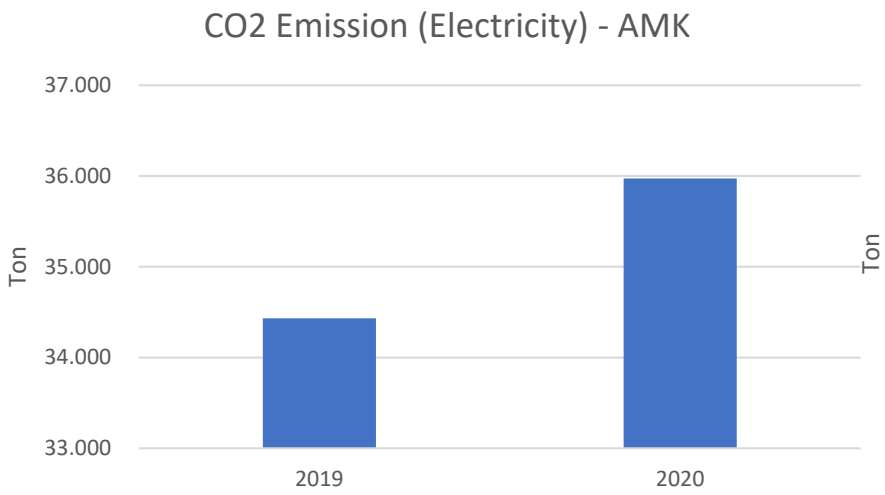


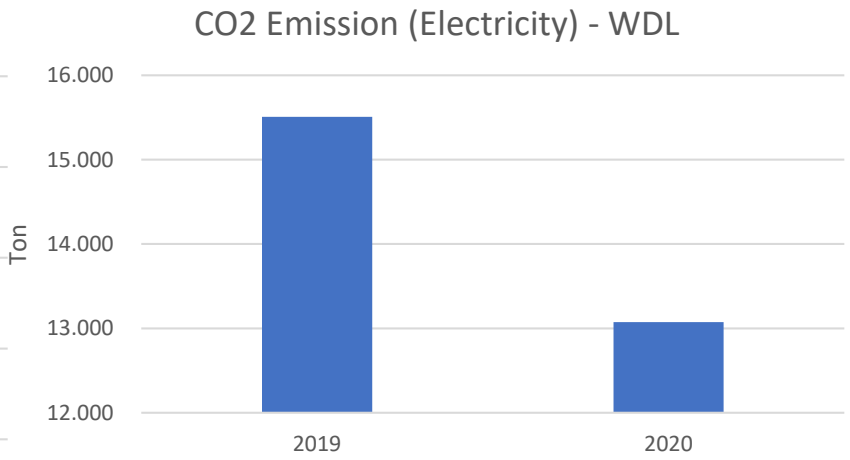
AMK	WDL	TMP
▪ **1,860 Ton waste (hazardous & nonhazardous) -** increased by 9% ▪ Did not meet the target of 1% reduction due to increased of waste generated as it was contributed by the increased pf packout volume • **42% Recycling rate in 2020**. Tracking of recycling rate started in 2020	• **339 Ton waste (hazardous & nonhazardous)** - increased by 26% ▪ Did not meet the target of 1% reduction due to increased of waste generated as it was contributed by the increased pf packout volume • **29 % Recycling rate in 2020**. Tracking of recycling rate started in 2020	• **255 Ton waste (hazardous & nonhazardous) -** reduced by 16% ▪ Met the target of 1% reduction, actual reduction is 16% • **24% Recycling rate in 2020**. Tracking of recycling rate started in 2020

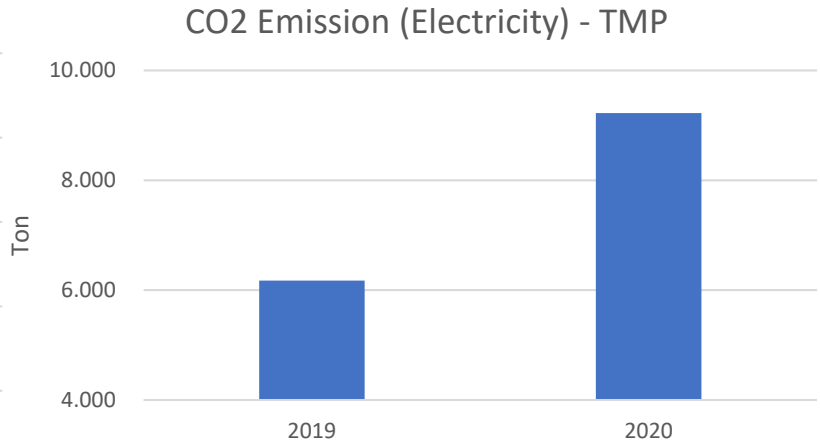
	AMK		WDL		TMP	
	2019	**2020**	**2019**	**2020**	**2019**	**2020**
Packout, Mpcs	403	418	333	642	-	-
Packout, Kpcs (wafer)	-	-	-	-	24	41

Environmental Performance, AMK, WDL & TMP

CO2 (Electricity) in 2020







AMK	WDL	TMP
36K Ton CO2 emission - increased by 4%	**13K Ton CO2-** decreased by16%	**9K Ton CO2-** increased by 49%

Thank you!

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