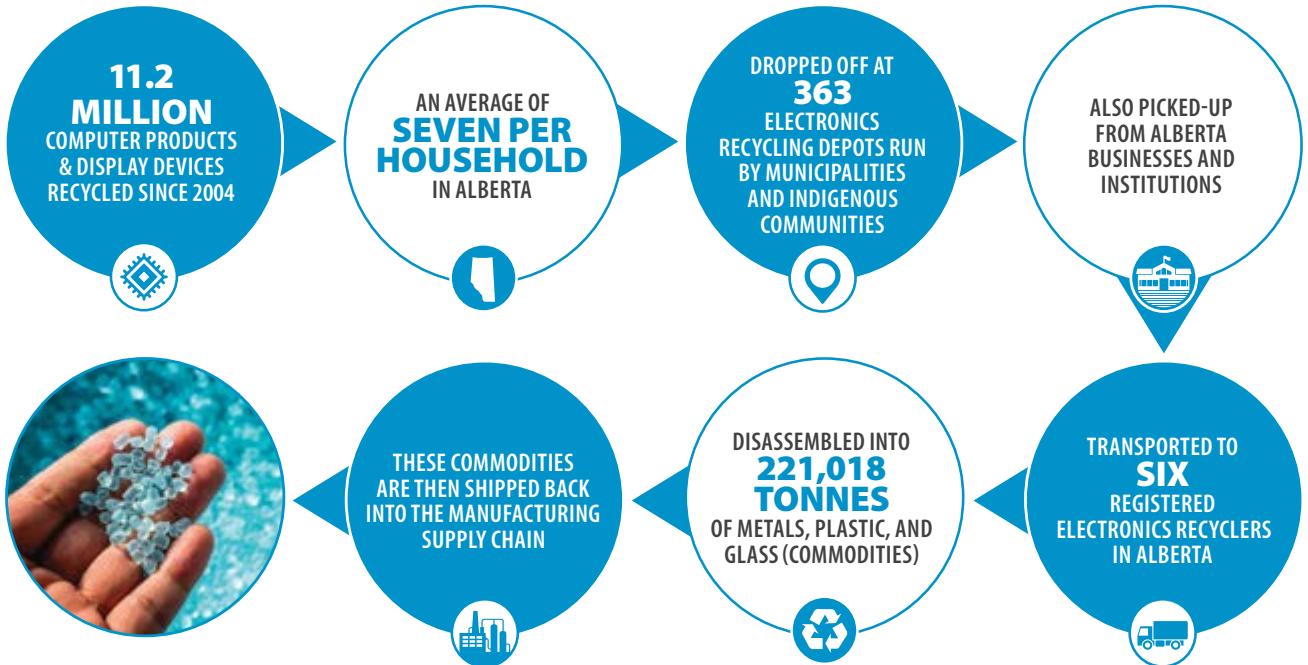




ELECTRONICS RECYCLING

2021-22 PROGRESS REPORT



MAKING RECYCLING MORE CONVENIENT

96% of the population live no further than a 20-minute drive from an electronics recycling depot.

ELECTRONICS RECYCLING RESULTS

This chart displays the results of electronics recycling over the last three years. Processed volumes in 2021/22 continues to decline as the trend toward lighter devices continues over time. There were 25 Hard-to-Get Electronics Roundups held this year by non-profit organizations and community groups (with uptake in larger centres).

	TONNES	PROGRAM MATERIALS KG. PER CAPITA	RECOVERY RATE**	ePILOT MATERIALS* TONNES
2019/20 Result	10,776	2.45	41%	N/A
2020/21 Result	8,600	1.94	31%	5,538
2021/22 Target	11,034	2.50	33%	N/A
2021/22 Result	8,493	1.90	35%	4,678

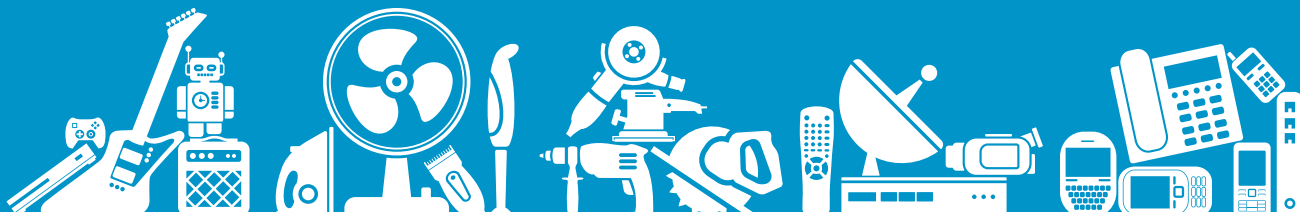
*2020/21 ePilot tonnage represents six months of operation plus a clean-up of volumes at processor sites at the outset of the ePilot. 2021/22 ePilot tonnage represents 12 months of operation.

**Recovery rates previously reported for 2019/20 and 2020/21 have been amended based on an update to the calculation methodology, utilizing more up-to-date product weight data.

ELECTRONICS EXPANDED

The ePilot has received strong support from Albertans with over 6,400 tonnes of devices being dropped off for recycling in the categories of small appliances, audio visual, telecom, power and air tools, games, toys and music, and lawn and garden material.

The data gathered through the ePilot project—which began in September 2020—will be used to develop recommendations to be submitted to the province in 2022 to modernize the electronics recycling program for the long term.



PROGRAM SUSTAINABILITY

ARMA conducts ongoing financial analysis and projections to determine if changes to fees or recycling expenditures are warranted to meet program goals and ensure program sustainability. Through this analysis an interim reduction on fees was supported by the Minister of Environment and Parks for 2021–22.

There are **1,435 electronics producers and suppliers** registered to remit fees Albertans pay on eligible electronics purchased that help fund the cost to collect and recycle this material. ARMA values their commitment as part of the frontline of the program.

		FEES TO SEPT. 20/21	FEES AS OF OCT. 1/21
	TVS, MONITORS, AND ALL-IN-ONE COMPUTERS LESS THAN 30 INCHES	\$4.00	\$2.50
	TVS, MONITORS, AND ALL-IN-ONE COMPUTERS 30 INCHES OR LARGER	\$10.00	\$6.00
	COMPUTERS AND SERVERS	\$4.40	\$2.00
	LAPTOP, NOTEBOOK, AND TABLET COMPUTERS	\$1.20	\$0.80
	PRINTERS, SCANNERS, PHOTOCOPIERS, AND FAX MACHINES	\$4.80	\$3.00

FEE MANAGEMENT

RECYCLING EXPENDITURES



Collection and recycling of electronics

RECYCLING DEVELOPMENT



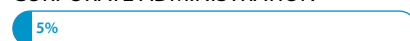
R&D; Program awareness

PROGRAM DELIVERY EXPENDITURES



Costs to deliver the program

CORPORATE ADMINISTRATION



Corporate costs

RECYCLING IN ACTION

Through ARMA's Curbside Roundup pilot, Albertans were provided with an opportunity to safely and conveniently recycle their electronics, paint, tires, and used oil materials.



PROGRAM PARTICIPATION AND ACCESS

Municipalities and Indigenous communities are key partners on the front line of the program, managing **363 electronics recycling depots** in 145 communities across the province. Each site is reviewed annually, with ARMA field staff assisting site operators to ensure they are maximizing the tools available to them through the program.

Additionally, **42 Recycling Roundups** were held this year. These are special community events that provide an additional opportunity for Albertans to recycle over and above the year-round depots.



PROGRAM SUPPORT

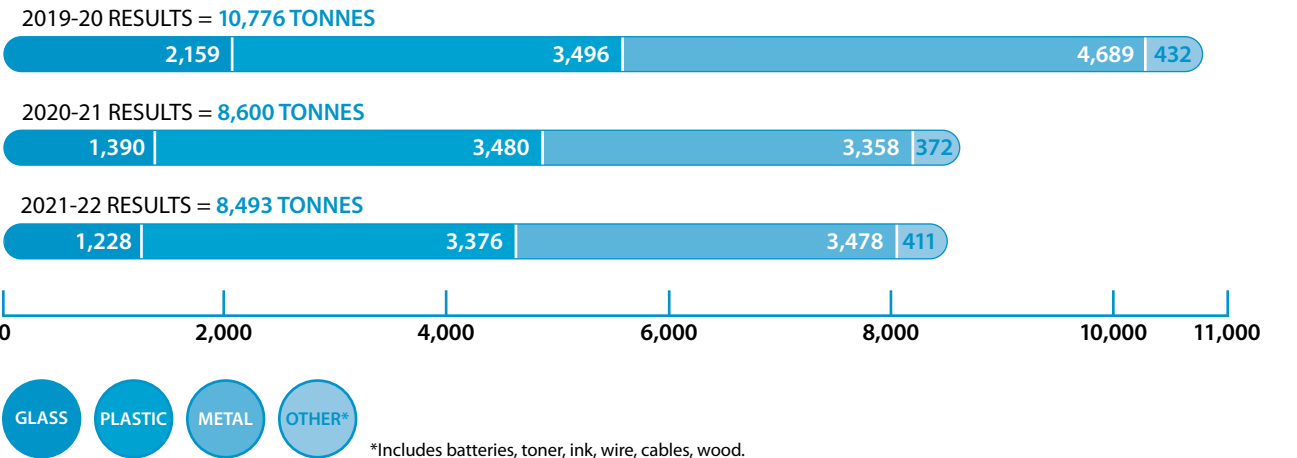
Albertans’ support of the electronics recycling program remains strong, as measured in this year’s survey. This response helps drive the program’s success as a means to effectively divert end-of-life electronics from landfills.

YEAR	PROGRAM SUPPORT
2017/18 Result	89%
2018/19 Result	85%
2021/22 Result	87%

HOW 11.2 MILLION ELECTRONICS ARE RECYCLED

Registered recyclers pick up TVs and computer products from businesses and institutions, and from **363 recycling depots** across the province. They transport the material back to their facilities (all located in Alberta) where they break down each item, separating the materials into metals, plastic and glass. These commodities are then

shipped back into the manufacturing supply chain. The following are results from the past three years, revealing a year-over-year decrease in glass and plastic which could be indicative of a decrease in cathode-ray-tube TVs and monitors available for recycling.



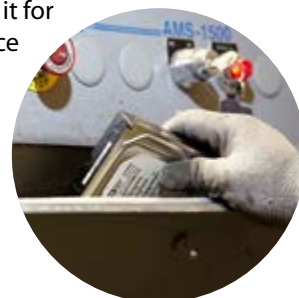
KEEPING HAZARDOUS SUBSTANCES OUT OF THE LANDFILL

Since 2004, **15,095 tonnes** of hazardous material has been safely and properly handled during the recycling process. The following are results from the past three years showing some of the substances of concern that have been diverted from the landfill.

	MATERIAL	2019-20	2020-21	2021-22
	Lead (tonnes) Circuit boards, cathode ray tubes, TVs, monitors, CPUs, laptops, and printers.	285	289	270
	Mercury (kg.) Batteries - general; mercury lamp batteries and switches; laptops	0.31	0.34	0.36
	Cadmium (kg.) Circuit boards, cathode ray tubes, insulated wire, TVs, monitors, and CPUs	3.87	4.10	3.13
	Beryllium (kg.) Circuit boards, TVs, and monitors	12.10	12.30	11.50
	Antimony (tonnes) Circuit boards, CPUs, laptops, and printers	1.26	1.25	1.07

SECURITY

Electronics recyclers registered with ARMA adhere to registered processor compliance requirements, ensuring safe and proper disposal of personal information found on devices. However, ARMA recommends wiping your device or hard drive before recycling it for your peace of mind.



ENVIRONMENTAL COMPLIANCE

A program goal is to ensure registered recyclers operate in an environmentally and socially responsible manner. Annual environmental audits by external experts are conducted to confirm if the recyclers are following program requirements. Results are reported annually in a "Compliance Assurance Summary Report" found at albertarecycling.ca



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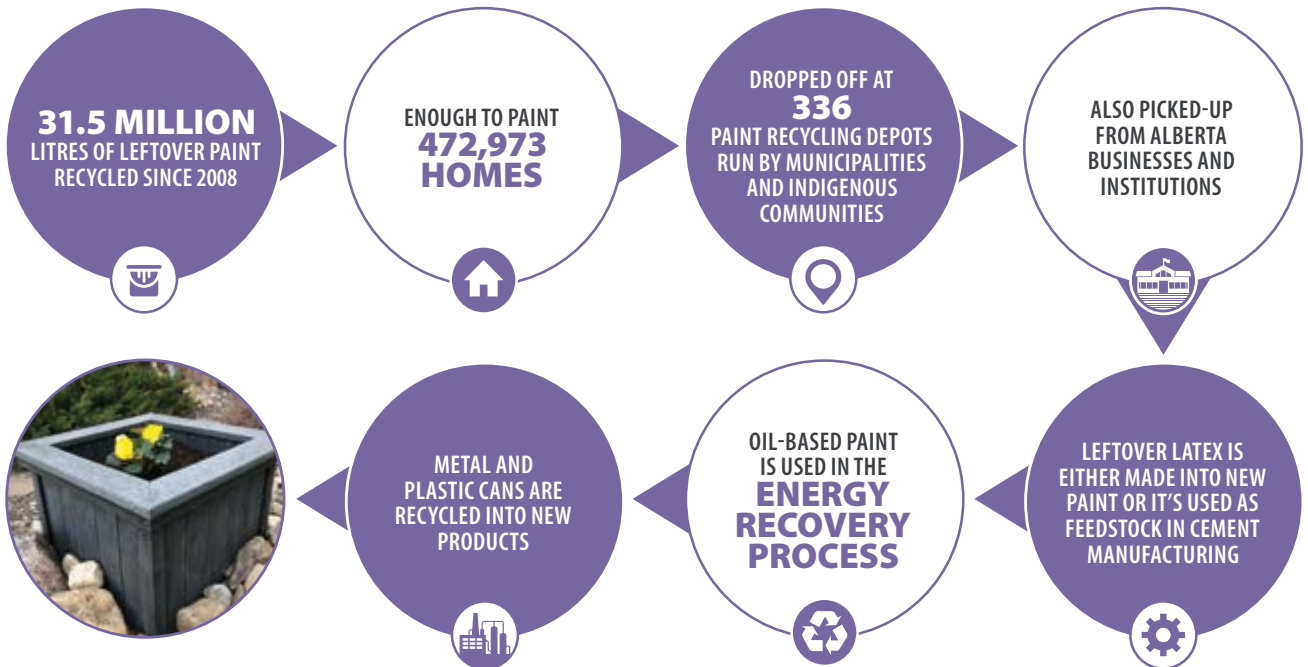


ARMA oversees end-of-life processing of tires, electronics, paint and used oil materials on behalf of the province. Since 1992, ARMA has worked with a broad spectrum of stakeholders to shape recycling policy, create a value-added processing system, minimize waste entering landfills and to act as collective stewards of Alberta's environment.



PAINT RECYCLING

2021-22 PROGRESS REPORT



MAKING RECYCLING MORE CONVENIENT

93% of the population live no further than a 20-minute drive from a paint recycling depot.

PAINT RECYCLING RESULTS

This chart displays results of paint recycling over the last three years. While sales of new paint and volumes of recycled paint remained strong in 2021/22, both metrics eased from the higher-than-typical results seen in 2020/21 (during the first year of the COVID-19 pandemic when travel and other restrictions drove an increased volume of residential painting activity).

PAINT AND COATINGS PROCESSED	KG. (MILLIONS)	LITRES* (MILLIONS)	KG. PER CAPITA	RECOVERY RATE	CAPTURE RATE
2019/20 Result	2.74	2.28	0.62	10.0%	83.2%
2020/21 Result	3.02	2.51	0.68	9.2%	76.5%
2021/22 Target	2.93	2.44	0.66	10.3%	85.5%
2021/22 Result	2.95	2.46	0.66	9.5%	79.0%

*Based on an average weight per litre of 1.2 kg.

RECYCLING RESULTS FOR PAINT CANS

Reported volumes of recycled containers in 2021/22 increased more than 70% over the prior year. This is due to a combination of factors including the incentive paid to processors on containers, improved reporting by processors, and strong sales. Conversely, aerosol volumes decreased in 2021/22 with less activity in the business sector (where the bulk of this material is generated) due to COVID-19.

AEROSOL PAINT CANS PROCESSED

	UNITS	RECOVERY RATE
2019/20 Result	705,920	15.8%
2020/21 Result	702,697	14.0%
2021/22 Target	708,374	15.8%
2021/22 Result	651,743	14.3%

PAINT AND COATING CONTAINERS PROCESSED

	METAL (KG.)	PLASTIC (KG.)	TOTAL (KG.)
2019/20 Result	259,567	151,466	411,033
2020/21 Result	255,133	161,776	416,908
2021/22 Target	236,809	229,072	465,881
2021/22 Result	402,278	309,721	711,999

PROGRAM SUSTAINABILITY

The environmental fees that Albertans pay when buying new paint products helps fund the collection and recycling of these materials along with other program related costs.

There are **516 paint producers and suppliers** registered with ARMA who collect these fees on the sale of each eligible product sold in Alberta and remit the funds to ARMA. We value their commitment and diligence as part of the frontline of the paint recycling program.

	100ml to 250ml	\$0.25
	251ml to 1L	\$0.50
	1.01L to 5L	\$1.00
	5.01L to 23L	\$2.25
	Aerosol/Spray Paint Cans (all sizes)	\$0.25

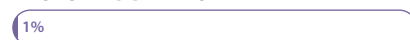
FEE MANAGEMENT

RECYCLING EXPENDITURES



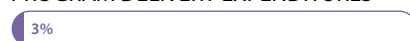
Collection and recycling of paint and containers

RECYCLING DEVELOPMENT



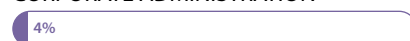
R&D; Program awareness

PROGRAM DELIVERY EXPENDITURES



Costs to deliver the program

CORPORATE ADMINISTRATION



Corporate costs

PROGRAM SUPPORT

Albertans' support of the paint recycling program continues to be strong, as measured in this year's survey. This helps drive its success to effectively divert leftover paint and containers from landfills.

YEAR

SUPPORT

2017/18 Result	82%
2018/19 Result	82%
2021/22 Result	79%

ALBERTA BUSINESSES RECYCLE THEIR PAINT

Commercial paint roundups are firmly established events in Edmonton, Calgary, and for the second year in a row, Red Deer. The roundups enable painting contractors and businesses to drop off unlimited amounts of program paint at no charge. ARMA staff are also on site to help unload material.



RECYCLING EMPTY METAL & PLASTIC PAINT CANS

Metal paint cans and plastic pails are an equally important part of the paint recycling program as the environmental fees paid at the time of purchase help fund the collection and recycling of these materials.

The plastic pails collected by paint recyclers are shipped to an approved processor in southern Alberta and recycled into composite lumber, fence posts, and parking curbs.

The metal cans are recycled into industrial products such as rebar.



ENVIRONMENTAL COMPLIANCE

A program goal is to ensure leftover paint and containers are collected and shipped by the registered recyclers to downstream processors in an environmentally and socially responsible manner. Regular inspections by ARMA and an environmental audit by external experts every three years confirm recyclers are meeting program requirements.



WHAT HAPPENS TO YOUR LEFTOVER PAINT?

Registered recyclers pick up leftover or unused paint and empty cans from **336 paint recycling depots** and recycling roundups (39 events in 2021/22) as well as from businesses and institutions.

Oil-based paint is bulked and shipped to approved downstream processors to be used in fuel blends to provide alternative fuel sources.

Latex paint is delivered to an approved recycler in Alberta for processing into new paint or, if the latex is solid or semi-solid, it is used as feedstock in cement manufacturing.



Alberta
recycling
MANAGEMENT AUTHORITY

30 YEARS



ELECTRONICS



PAINT



TIRES



USED OIL

PRINTED ON RECYCLED PAPER



INSPIRING A FUTURE WITHOUT WASTE

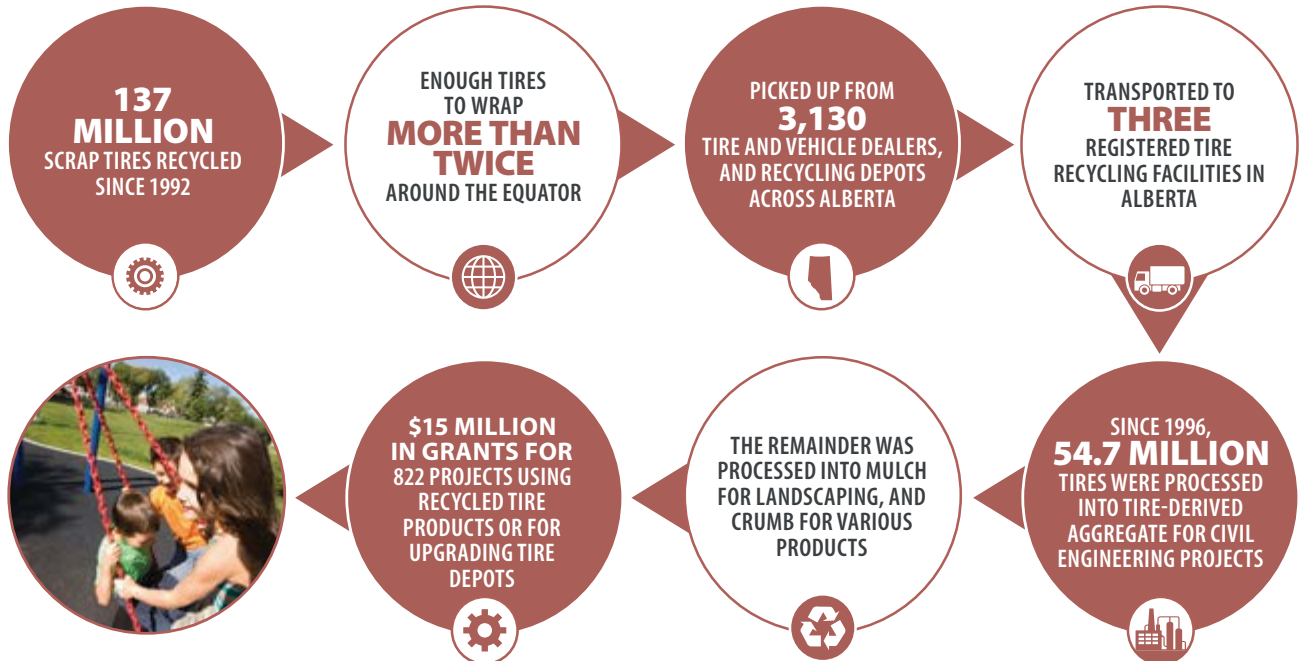
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ARMA oversees end-of-life processing of tires, electronics, paint and used oil materials on behalf of the province. Since 1992, ARMA has worked with a broad spectrum of stakeholders to shape recycling policy, create a value-added processing system, minimize waste entering landfills and to act as collective stewards of Alberta's environment.



TIRE RECYCLING 2021-22 PROGRESS REPORT



TIRE SUPPLIERS' RECYCLING ROLE

When Albertans get new tires, they usually leave their old ones behind. They can because vehicle and tire dealers, and auto repair shops play a dual role—selling new tires and making sure the old scrap tires you leave behind are collected for recycling at Alberta facilities.

TIRE RECYCLING RESULTS

Tire volumes collected in 2021/22 increased over the year as sales of tires recovered from the lower levels seen during the first year of the COVID-19 pandemic. Processing volumes declined slightly, and year-end processor inventory increased over the prior year. This chart displays results of tire recycling over the last three years.

**Passenger and Light Truck Tires (PLTT), Medium Truck Tires (MTT), Specialty, Industrial and Other Tires (SIO).*

†The Recovery Rate for 2021/22 has been shifted to evaluate Collected tire volumes as a percentage of tire sales to more accurately reflect the activity of collecting and transporting tires into the recycling system. This replaces the methodology of evaluating Processed tire volumes as a percentage of tire sales; which was highly impacted in the tire program by large changes in processor inventories from year to year. The Recovery Rates for 2019/20, 2020/21 and the 2021/22 Target have been adjusted from previously reported figures to utilize the new methodology.

TIRES PROCESSED	— TONNES —		KG. PER CAPITA	RECOVERY RATE FOR PLTT, MTT, AND SIO TIRES *†	RECOVERY RATE FOR OFF-THE- ROAD-TIRES †
	COLLECTED	PROCESSED			
2019/20 Result	70,956	62,328	14.16	94%	88%
2020/21 Result	67,804	66,461	14.98	95%	80%
2021/22 Target	70,804	66,429	15.06	96%	64%
2021/22 Result	73,572	66,308	14.80	96%	65%



\$15 MILLION IN GRANTS SINCE 2000

Albertans have had great mileage from their tire recycling program with \$15 million in grants since 2000. Across the province you will find recycled tire products in **628 community grant projects** such as playgrounds, arenas, outdoor fitness areas, and walking trails.

157 grants have been awarded to Indigenous communities and municipalities for upgrading tire collection areas at landfills and transfer stations.

PROGRAM SUPPORT

Albertans' support of the tire recycling program remains strong, as measured in this year's survey. This response helps drive the program's success as a means to effectively divert scrap tires from landfills.

YEAR

PROGRAM SUPPORT

2017/18 Result

83%

2018/19 Result

83%

2021/22 Result

80%

ENVIRONMENTAL COMPLIANCE

A program goal is to ensure all scrap tires are collected and processed by registered recyclers in an environmentally and socially responsible manner. Monthly inspections by ARMA and an environmental audit by external experts every three years confirm recyclers are meeting program requirements.



PROGRAM SUSTAINABILITY

Results for the 2020/21 sustainability review of registered tire processors was a key component in the consultation process taking place in the fall of 2021 with industry stakeholders to consider increasing the environmental fee on MTT for the sustainability of the program. This proposal received strong support from stakeholders, including the province, resulting in the fee increase to \$14.00 from \$9.00, effective April 1, 2022. The results of the sustainability review also informed incentive changes for the registered processors.

FEE MANAGEMENT

RECYCLING EXPENDITURES



Collection and recycling of tires

RECYCLING DEVELOPMENT



R&D; Program awareness

PROGRAM DELIVERY EXPENDITURES



Costs to deliver the program

CORPORATE ADMINISTRATION



Corporate costs



	CAR AND LIGHT TRUCK TIRES INCL. SPARES, SPORT & CROSS-OVER UTILITY, MEDIUM TRUCK <19.5" RIM	\$4.00/tire
	SPECIALTY, INDUSTRIAL AND OTHER TIRES INCL. TRAILER, ATV, DIRT BIKE, FORKLIFT, SMALL LOADERS, AND SKID-STEERS	\$4.00/tire
	MEDIUM TRUCK TIRES INCL. LARGE COMMERCIAL FREIGHT TRUCKS, AND PASSENGER BUSES	\$14.00/tire as of April 1, 2022
	OFF-THE-ROAD TIRES INCL. CONSTRUCTION, ROAD BUILDING, FORESTRY MINING, ETC.	\$40.00, \$100.00, or \$200.00/tire depending on rim size

This chart breaks out the amount of tires processed by type for the past three years. Tires vary in size and weight, therefore a standardized unit is applied to present the results, using a passenger-tire-equivalent (PTE) of one PTE equaling 10 kgs. There is 100 PTEs in one tonne of tires.

YEAR	PASSENGER, LIGHT TRUCK, SPECIALTY, INDUSTRIAL & OTHER TIRES (PTE)	MEDIUM TRUCK TIRES (PTE)	OFF-THE-ROAD TIRES (PTE)
2019/20	3,922,100	1,929,100	381,600
2020/21	4,099,700	2,096,000	450,400
2021/22	4,302,000	1,934,400	394,300

WHAT HAPPENS TO YOUR SCRAP TIRES?

Two registered recyclers coordinate the collection of scrap tires from 3,130 vehicle and tire dealers, auto repair shops, and 357 tire recycling depots. Since 2002, 4-H clubs have partnered with ARMA to clean up rural areas, collecting 1.25 million tires for which they have received funding per tire.



STAGE 1

Tires are shredded into spec pieces for use as tire-derived aggregate (TDA). The steel and fibre are still embedded.

APPLICATION: TDA is a cost-effective alternative to conventional aggregate (a limited and non-renewable resource) for use in leachate drainage blankets.



STAGE 2

The shredded tires are ground to make mulch, with the steel removed.

APPLICATION: For use in landscaping.



STAGE 3

The shredded tires are processed into crumb, with the steel and fibre removed.

APPLICATION: For use in playground surfaces, various molded products, synthetic turf, and athletic tracks.



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ARMA oversees end-of-life processing of tires, electronics, paint and used oil materials on behalf of the province. Since 1992, ARMA has worked with a broad spectrum of stakeholders to shape recycling policy, create a value-added processing system, minimize waste entering landfills and to act as collective stewards of Alberta's environment.



USED OIL MATERIALS RECYCLING

2021-22 PROGRESS REPORT

**OVER
1.9 BILLION**
LITRES OF USED OIL
RECOVERED SINCE 1997



ENOUGH OIL FOR
380,000,000
VEHICLES



USED OIL IS
PICKED UP FROM A
VARIETY OF INDUSTRIES
ACROSS ALBERTA



ALSO PICKED-UP FROM
235
RECYCLING
DEPOTS



LOWER QUALITY
OIL HELPS FUEL
VARIOUS INDUSTRIAL
APPLICATIONS



HIGH QUALITY OIL IS
RE-REFINED INTO NEW
LUBRICATING OIL



TRANSPORTED TO
FIVE
REGISTERED OIL
PROCESSORS
IN WESTERN CANADA



MAKING RECYCLING MORE CONVENIENT

Municipalities and Indigenous communities are committed to this program and have established **235 recycling depots** and held **28 roundups** in 2021/22 for the collection of used oil materials.

USED OIL RECOVERY RESULTS

This chart presents results over the last three years for used oil recovery. 2021/22 shows a 6.5% increase in oil recovered over 2020/21. This is a result of slightly loosened travel restrictions, but still similarly reduced business activity/expenditure due to the impact of COVID-19.

USED OIL RECOVERED	LITRES* (MILLIONS)	KG. (MILLIONS)	KG. PER CAPITA	CAPTURE RATE
2019/20 Result	86.61	75.35	17.12	79.7%
2020/21 Result	73.26	63.74	14.37	74.0%
2021/22 Target	82.59	71.85	16.29	78.9%
2021/22 Result	78.05	67.91	15.16	70.2%

Definition of capture rate: industry estimates that 35.5% of oil sold is consumed during use, leaving 64.5% as end-of-life.

**Based on an average weight per litre of 0.87 kg.*

COLLECTION AND PROCESSING RESULTS FOR FILTERS

The chart presents results over the last three years for used oil filters collected and processed. 2021/22 saw a 6.4% increase in collected volumes and an 8.5% increase in processed volumes of filters.

FILTERS COLLECTED AND PROCESSED	— KG. (MILLIONS) —		KG. PER CAPITA	RECOVERY RATE
	COLLECTED	PROCESSED		
2019/20 Result	4.49	3.24	1.02	82.3%
2020/21 Result	3.74	2.67	0.84	77.0%
2021/22 Target	4.20	3.02	0.95	80.2%
2021/22 Result	3.98	2.90	0.89	74.1%

Definition: Recovery rate measures the amount collected as a percent of the amount purchased.



COLLECTION AND PROCESSING RESULTS FOR CONTAINERS

This chart presents results over the last three years for containers collected and processed.

The disparity between container volumes for 2019/20 and those for 2020/21 and 2021/22 results from changes ARMA made to container incentives to better align with the regulation. This change involved discontinuing payments for processing of non-program containers, while allowing for a tolerance level to support a smooth transition period for processors of containers.

Additionally, COVID-19 impacted the volume of containers sold and recovered for the past two fiscal years.

CONTAINERS COLLECTED AND PROCESSED	— KG. (MILLIONS) —		KG. PER CAPITA	RECOVERY RATE
	COLLECTED	PROCESSED		
2019/20 Result	2.37	2.07	0.54	95.6%
2020/21 Result	2.15	1.61	0.49	92.2%
2021/22 Target	2.02	1.70	0.46	79.8%
2021/22 Result	2.11	1.77	0.47	87.1%



PROGRAM SUPPORT

Albertans' support of the used oil materials recycling program remains strong, as measured in this year's survey. This response helps drive the program's success to effectively recover used oil materials.

YEAR	SUPPORT
2018/19 Result	86%
2021/22 Result	82%

PROGRAM SUSTAINABILITY

The environmental fees Albertans pay for new oil materials are used to help fund the collection and recycling of leftover material along with other program-related costs. There are **281 producers and suppliers** registered to remit fees on eligible product sold. ARMA values their commitment as part of the front line of the program.

ARMA also conducts ongoing financial analysis and projections to determine if changes to fees or recycling expenditures are warranted to meet program goals and ensure program sustainability.

FEE MANAGEMENT

RECYCLING EXPENDITURES



Collection and recycling of used oil materials

RECYCLING DEVELOPMENT



R&D; Program awareness

PROGRAM DELIVERY EXPENDITURES



Costs to deliver the program

CORPORATE ADMINISTRATION



Corporate costs

WHAT HAPPENS TO YOUR EMPTY CONTAINERS AND USED FILTERS

Plastic oil containers and metal oil filters are an equally important part of the Used Oil Materials Recycling Program as the environmental fees paid at the time of purchase help fund the collection and recycling of these materials.

The containers are pelletized and used as feedstock for new plastic products such as composite lumber, fence posts, and parking curbs. Oil filters are crushed (with the residual oil captured) and processed into industrial materials such as rebar.



ENVIRONMENTAL COMPLIANCE

An objective of the program is to ensure that all used oil materials are collected and processed by registered recyclers in an environmentally and socially responsible manner. Monthly inspections by ARMA and an environmental audit every three years, confirm if the recyclers are following the requirements of the program.





RECYCLING IN ACTION

Through ARMA's curbside roundup pilot, some backyard mechanics were provided with an opportunity to conveniently recycle their used oil materials.



PROPOSED PROGRAM EXPANSION

In 2021/22 ARMA received direction from Alberta Environment and Parks to consult with industry associations and other stakeholder organizations regarding expanding the program to include:

- Diesel Exhaust Fluid (DEF) containers
- Glycol/Antifreeze concentrate and pre-mix
- Glycol/Antifreeze containers
- Brake fluid containers
- Aerosol containers for brake cleaner, automotive parts cleaner, and lubricant
- Windshield washer fluid containers

The proposed expansion is also focused on increasing the maximum container size in the program from 30L to 210L. The first phase of consultation took place from September/21 – March/22 with industry support received for the materials listed above to be included in a program expansion.



ELECTRONICS



PAINT



TIRES



USED OIL



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