



MAKING RECYCLING MORE CONVENIENT

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

This chart displays the results of electronics recycling over the last three years. The total amount processed in 2020/21 decreased by 20% over the prior year. A significant contributor to this decrease was the launch of the e-pilot project in Sept. 2020 which saw registered processors temporarily reduce the processing of program material in order to process stockpiles of pilot materials.

Chart note: Recovery rate measures the amount processed as a percent of the amount purchased.

RECYCLING RESULTS FOR ELECTRONICS

2020/21 RESULT	8,600	1.94	\$1.09	24%
2020/21 TARGET	10,286	2.40	\$1.13	32%
2019/20 RESULT	10,776	2.45	\$1.07	33%
2018/19 RESULT	10,111	2.33	\$1.09	34%
YEAR	TOTAL PROCESSED (TONNES)	KG. PER CAPITA	TOTAL COST PER KG.	RECOVERY RATE

20/21 results do not include e-pilot material; see next page for e-pilot results.

ELECTR NICS EXPANDED

In September 2020, a two-year e-pilot project approved by government was launched. This project could see an additional 24,600 tonnes of electronics recycled with the potential to inject **\$30 million** GVA (Gross Value Added) annually into Alberta's economy and create 360 FTE (Full Time Equivalency) in the recycling sector.

Municipalities and Indigenous communities, who were excited to divert more electronics from their landfills, responded strongly to the e-pilot by registering over **275 depots** to accept an additional 500 types of electronic devices in six categories: small appliances, audio visual, telecom, power & air tools, games, toys and music, lawn & garden. This has resulted in **1,286 tonnes** processed to date.

Innovation is a cornerstone of ARMA's vision of *Inspiring a Future Without Waste* and this is evident in the e-pilot with our approach to addressing solar panels. There is currently no program in North America for the reuse or recycling of this product. Our working group, comprised of industry experts, seeks to change that and establish Alberta as a leader by confirming handling methods for solar panels.

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, with a full reset of fees to be addressed at the end of the e-pilot in the latter part of 2022.

There are 1,439 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 front line of the program.

FEES TO FEES

	SEPT. 30/21	AS OF OCT. 1/21
TVS, MONITORS & ALL-IN-ONE COMPUTERS LESS THAN 30 INCHES	\$4.00	\$2.50
TVS, MONITORS & 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, FAX MACHINES	\$4.80	\$3.00

Fee Management
Recycling Expenditures
84%
Collection and recycling of electronics
Recycling Development
4%
R&D Program awareness
Program Delivery Expenditures
5%
Costs to deliver the program
Corporate Administration
7%
Corporate costs



E-PILOT IN ACTION

This is just one example of the project's positive impact on our environment. These before-and-after photos illustrate a stockpile of e-pilot material stored at a registered recycler's facility prior to the project (ensuring it wouldn't be landfilled). Once the e-pilot was launched, the registered processors were able to process just over **3,375 tonnes** of stockpiled devices.



PROGRAM PARTICIPATION AND ACCESS

Municipalities and Indigenous communities are key partners on the front line of the program. They manage **361 electronics** recycling depots that were deemed an essential service during the COVID pandemic.

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, **33 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.



KEY STAKEHOLDER AWARENESS AND SUPPORT

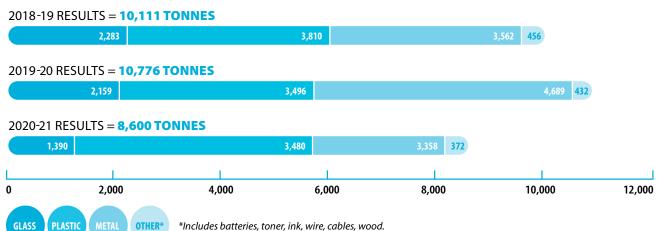
This year ARMA held over **125 virtual meetings** and dialogues with stakeholders in the fields of industry, post-secondary institutions, municipal and provincial governments, and Indigenous relations, creating/supporting opportunities for innovation and expansion of existing and future programs.

Some of the subject matter included a 'made-in-Alberta' plastics solution, exploring different EPR models, and collaborations on various development opportunities with other provincial recycling programs and organizations.

HOW 10.6 MILLION ELECTRONICS ARE RECYCLED

Registered recyclers pick up TVs and computer products from businesses and institutions and from **361 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. 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.





KFFPING HAZARDOUS SUBSTANCES OUT OF THE LANDFILL

Since 2004, 14,412 tonnes of hazardous material has been safely and properly handled during the recycling process. Following are results from the past three years showing some of the substances of concern diverted from the landfill.

Material		2018-19	2019-20	2020-21
Pb Lead	Lead (tonnes) Circuit boards, cathode ray tubes, TVs, monitors, CPUs, laptops, and printers.	279	285	289
Hg Mercury	Mercury (kg.) Batteries - general; mercury lamp batteries and switches; laptops	0.28	0.31	0.34
48 Cd Cadmium	Cadmium (kg.) Circuit boards, cathode ray tubes, insulated wire, TVs, monitors and CPUs	4.08	3.87	4.10
Be Beryllium	Beryllium (kg.) Circuit boards, TVs and monitors	11.90	12.10	12.25
Sb Antimony	Antimony (tonnes) Circuit boards, CPUs, laptops, and printers	1.32	1.26	1.25



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 to give yourself 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



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.











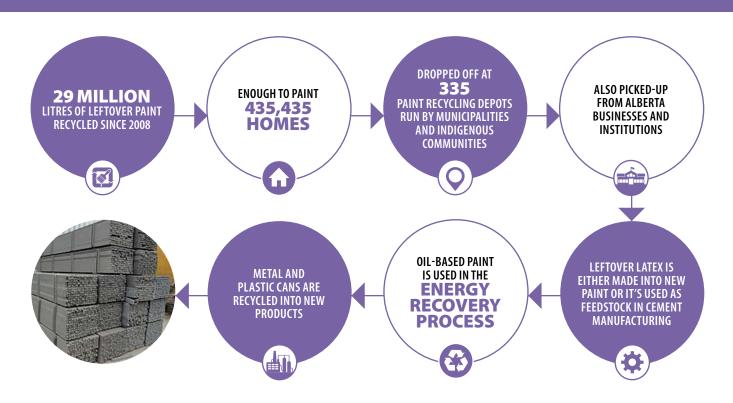
Inspiring a Future Without Waste –



PAINT RECYCLING

2020-21 PROGRESS REPORT







MAKING RECYCLING MORE CONVENIENT

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

This chart displays results of paint recycling over the last three years. 2020-21 shows an **increase of 10%** over the prior year. Paint sales were very strong under COVID-19 conditions with Albertans completing home projects. This resulted in increased volumes of leftover paint brought in for recycling sold.

Chart note: Capture rate measures the amount processed as a percent of the estimated amount leftover.

RECYCLING RESULTS FOR PAINT

YEAR	KG. PROCESSED (MILLIONS)	LITERS PROCESSED (MILLIONS)	KG. PER CAPITA	TOTAL COST PER KG.	CAPTURE RATE
2018/19 RESULT	2.62	2.19	0.61	\$1.72	77.2%
2019/20 RESULT	2.74	2.28	0.62	\$1.55	83.2%
2020/21 TARGET	2.72	2.26	0.63	\$1.58	87.7%
2020/21 RESULT	3.02	2.51	0.68	\$1.48	77.0%

RECYCLING RESULTS FOR PAINT CANS

Aerosol volumes in 2020/21 decreased slightly over the prior year with less activity in the business sector due to the impact of COVID-19.

PAI	NT CONTAIN	PAINT CONTAINERS PROCESSED					
YEAR	METAL CONTAINERS (KG.)	PLASTIC CONTAINERS (KG.)	TOTAL (KG.)				
2018/19 RESULT	228,709	112,857	341,566				
2019/20 RESULT	259,567	151,466	411,033				
2020/21 TARGET	236,809	116,853	353,662				
2020/21 RESULT	255,133	161,776	416,908				

AEROSC	AEROSOL CANS PROCESSED					
YEAR	AEROSOL PAINT CANS PROCESSED	RECOVERY RATE PERCENT				
2018/19 RESULT	752,141	15.7%				
2019/20 RESULT	705,920	15.8%				
2020/21 TARGET	658,123	14.9%				
2020/21 RESULT	702,697	14.2%				

PROGRAM SUSTAINABILITY

This year, ARMA conducted an industry consultation on revisions to the Paint Bylaw to increase the environmental fees on eligible paint sales. These fees had not changed since 2009 (one year after program inception). The proposed changes were supported by the Minister of Environment for implementation on April 1/21, and will ensure the program's sustainability and ability to meet its goals. Theses changes benefit municipalities and the paint recycling industry with adjustments to incentives, generating increased opportunities for Albertans and businesses in particular to recycle their leftover paint.

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 (any size)	\$0.25

Fee Management Expenditures based on pre-April 1/21 env. fees	
Recycling Expenditures	
	90%
Collection and recycling of paint and containers	
Recycling Development	
1%	
R&D Program awareness	
Program Delivery Expenditures	
4%	
Costs to deliver the program	
Corporate Administration	
5%	
Corporate costs	

KEY STAKEHOLDER AWARENESS AND SUPPORT

This year ARMA held over **125 virtual meetings** and dialogues with stakeholders in the fields of industry, post-secondary institutions, municipal and provincial governments, and Indigenous relations, creating/supporting opportunities for innovation and expansion of existing and future programs.

In the spirit of innovation, ARMA has brought together resources to develop a stronger 'made-in-Alberta' plastics solution. This project has partnered a post-secondary institution and a local downstream recycler to increase opportunities in maximizing their manufacturing line.

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 in general to drop off unlimited amounts of program paint at no charge. ARMA staff are also on hand to help unload material.



RECYCLING OF 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 335 paint recycling depots and recycling roundups (33 events in 2020-21) 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.

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.







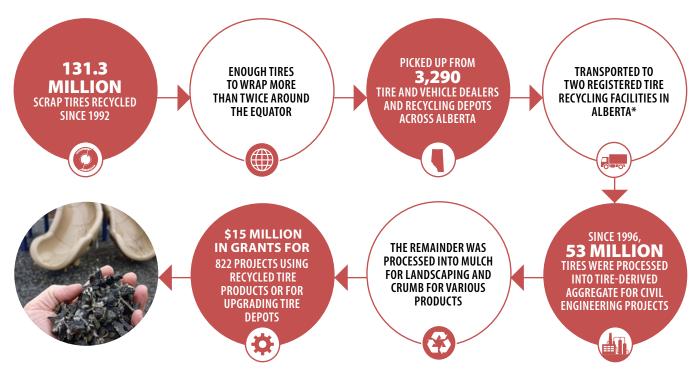




Inspiring a Future Without Waste











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.

DECOVEDY

DECOVEDY

This chart displays results of tire recycling over the last three years. In 2020/21 there was a **7% increase** over the previous year. While sales were down due to limited travel during COVID-19, recyclers processed scrap tires held in inventory from previous years.

Chart notes: Passenger and light truck - PLTT; Medium truck tires - MTT; Specialty, Industrial and 'Other' tires - SIO. Recovery rate measures the amount processed as a percent of the amount purchased.

RECYCLING RESULTS FOR TIRES

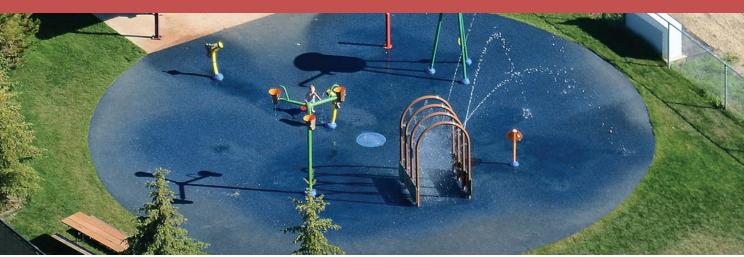
YEAR	TOTAL TIRES PROCESSED (TONNES)	TOTAL KG. PER CAPITA	TOTAL COST PER KG.	RECOVERY RATE FOR PLTT, MTT, AND SIO TIRES	RATE FOR OFF-THE-ROAD TIRES
2018/19 RESULT	67,611	15.61	\$0.39	86%	65%
2019/20 RESULT	62,328	14.16	\$0.41	85%	49%
2020/21 TARGET	64,881	15.14	\$0.42	86%	69%
2020/21 RESULT	66,461	14.98	\$0.38	94%	68%

ALBERTANS
HAVE GOTTEN
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.



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 Alberta Recycling and an environmental audit by external experts every three years confirm recyclers are meeting program requirements.



KEY STAKEHOLDER AWARENESS AND SUPPORT

ARMA held over **125 virtual meetings** and dialogues with stakeholders in the fields of industry, post-secondary institutions, municipal and provincial government, and Indigenous relations, creating and /or supporting opportunities for innovation and expansion of the existing programs and future possibilities.

Phase III of a life cycle assessment, specifically reviewing pyrolysis/thermal vacuum recovery, is in the process of completion in partnership with other provincial tire programs. Harmonized compliance reviews of tire suppliers across Canada were completed to create efficiencies in the review process for these companies.

Reviews at municipal and Indigenous tire recycling depots provided support for the sites in establishing efficient areas for tire collection that provide convenience for their residents and small businesses to recycle their tires.

PROGRAM SUSTAINABILITY

The environmental fees Albertans pay for new tires help fund the recycling of their old scrap tires along with other program-related costs. There are **2,936 tire producers and suppliers** registered to remit fees on eligible products sold. ARMA values their commitment as part of the front line of the program.

Fee Management

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.



Recycling Expenditures **Collection and recycling of tires** Recycling Development 3% **R&D; Program awareness* Program Delivery Expenditures 3% **Costs to deliver the program* Corporate Administration 5%

	CAR AND LIGHT TRUCK TIRES INCL. SPARES, SPORT & CROSS-OVER UTILITY, MEDIUM TRUCK < 19.5" RIM	\$4/tire
* ***********************************	SPECIALTY, INDUSTRIAL AND OTHER TIRES INCL. TRAILER, ATV, DIRT BIKE, FORKLIFT, SMALL LOADERS, SKID-STEERS	\$4/tire
(0,0), (0,0)	MEDIUM TRUCK TIRES INCL. LARGE COMMERCIAL FREIGHT TRUCKS AND PASSENGER BUSES	\$9/tire
	OFF-THE-ROAD TIRES INCL. CONSTRUCTION, ROAD BUILDING, FORESTRY MINING ETC.	\$40, \$100, or \$200/tire depending on rim size

Corporate costs

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 equalling 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)
2018-19	4,039,300	2,198,700	523,000
2019-20	3,922,100	1,929,100	381,600
2020-21	4,099,700	2,096,000	450,400



WHAT HAPPENS TO YOUR SCRAP TIRES

Two registered recyclers coordinate the collection of scrap tires from 2,936 vehicle and tire dealers, auto repair shops and 354 tire recycling depots. Since 2002 4-H clubs have partnered with Alberta Recycling to clean up rural areas, collecting **1.19 million tires** for which they have received funding per tire.



STAGE 1

Tires are shred 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

Shred is ground to make mulch, with the steel removed.

APPLICATION:

landscaping.



STAGE 3

Tires are processed into crumb with the steel and fibre removed.

APPLICATION:

Playground surfaces, various molded products, synthetic turf and athletic tracks.

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.

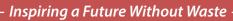












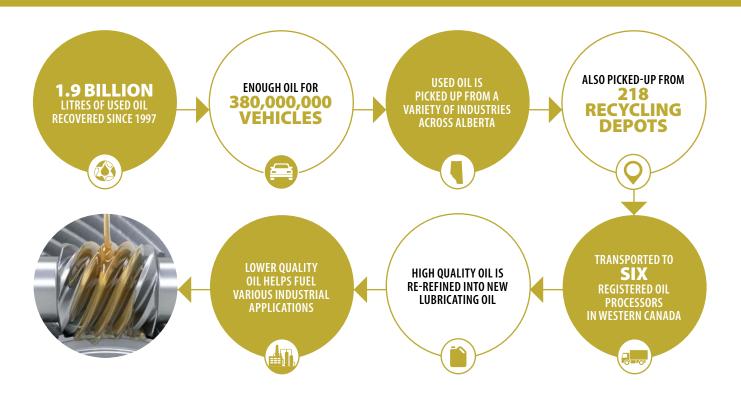




USED OIL MATERIALS RECYCLING

2020-21 PROGRESS REPORT







MAKING RECYCLING MORE CONVENIENT

Municipalities and Indigenous communities are committed to this program and have demonstrated this by registering an additional **40 recycling sites** this past year, bringing the total thus far to **218** used oil materials recycling depots registered with ARMA.

This chart presents results over the last three years of used oil recovery. This year shows a 15% decrease over 2019/20 resulting from limited travel and reduced business activity/ expenditure as a result of COVID-19.

Chart notes: The 2018/19 result reflects the last six months of operation under Alberta Used Oil Management Association and the first six months of operation under ARMA. Capture rate: industry estimates that 35.5% of oil sold is consumed during use, leaving 64.5% as end-of-life.

RESULTS OF USED OIL RECOVERY

	LITRES	KG.		
	PROCESSED	PROCESSED	KG. PER	CAPTURE
YEAR	(MILLIONS)	(MILLIONS)	CAPITA	RATE
2018/19 RESULT	84.49	73.50	16.97	76.6%
2019/20 RESULT	86.61	75.02	17.04	79.4%
2020/21 TARGET	87.68	76.28	17.80	81.9%
2020/21 RESULT	73.26	63.74	14.37	74.1%

The chart presents results over the last three years for used oil filters collected and processed. This year shows a 17% decrease over 2019/20 in collected volumes and an 18% decrease in processed volumes due to the impact of COVID-19 on travel and business activity. Since 1997, 160.6 million used oil filters have been collected.

Chart notes: The 2018/19 result reflects the last six months of operation under Alberta Used Oil Management Association and the first six months of operation under ARMA. Recovery rate measures the amount collected as a percent of the amount purchased.

USED OIL FILTERS COLLECTED AND PROCESSED

YEAR	KG. COLLECTED (MILLIONS)	KG. PROCESSED (MILLIONS)	KG. PER CAPITA	RECOVERY RATE
2018/19 RESULT*	4.50	3.36	1.04	80.2%
2019/20 RESULT	4.49	3.24	1.02	82.4%
2020/21 TARGET	4.63	3.42	1.08	82.7%
2020/21 RESULT	3.74	2.67	0.84	77.0%

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 **286 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

87%

Collection and recycling of used oil materials

Recycling Development

1%

R&D; Program awareness

Program Delivery Expenditures

5%

Costs to deliver the program

Corporate Administration

6%

Corporate costs



This year ARMA held over 125 virtual meetings and dialogues with stakeholders in the fields of industry, post-secondary institutions, municipal and provincial governments, and Indigenous relations, creating and supporting opportunities for innovation and expansion in the existing programs and future possibilities.

Three joint roundups for used oil and paint materials were held this year in Red Deer, Alberta's third largest city. A total of 6,000 litres of used oil were collected during these key events. At one of the events, residents were able to recycle expanded polysterene (EPS) through a collaboration with Nova Chemicals, Styro-Go, ARMA and the Alberta Plastics Recycling Association. This EPS pilot brought in an estimated 125 lbs. of material that will be turned into items such as mouldings for cabinetry, tiles and frames.

This chart presents results over the last three years for containers collected and processed. COVID-19 impacted the volume of containers generated for recycling due to limited travel and business activity.

The volume collected declined 9%. The volume processed declined more significantly at 22%. The disparity between these figures is a result of changes made to container incentives to better align with the Regulation whereby incentive payments on non-program containers were discontinued while allowing for a tolerance level to support a smooth transition period for processors of containers.

USED OIL CONTAINERS COLLECTED AND PROCESSED

YEAR	KG. COLLECTED (MILLIONS	KG. PROCESSED (MILLIONS)	KG. PER CAPITA	RECOVERY RATE
2018/19 RESULT	2.30	2.04	0.53	94.1%
2019/20 RESULT	2.37	2.07	0.54	95.6%
2020/21 TARGET	2.13	1.82	0.50	90.9%
2020/21 RESULT	2.15	1.61	0.49	92.6%

Chart notes: The 2018/19 result reflects the last six months of operation under Alberta Used Oil Management Association and the first six months of operation under ARMA. Recovery rate is measured as the amount collected as a percent of the amount purchased. Since 1997, 42.4 kg. of oil containers have been collected for recycling.



This chart displays the total combined cost per kilogram for used oil, filters, and containers over the last three years, encompassing: collection and recycling, recycling development, program delivery and corporate administration.

COMBINED TOTAL COST PER KG. OF USED OIL, FILTERS, CONTAINERS

2020/21 TARGET	81.88	18.60	\$0.19 \$0.19
TARGET 2020/21 RESULT	69.63	15.95	\$0.19



ENVIRONMENTAL COMPLIANCE

An objective of the program is to ensure that II 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.

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 products such as new containers, quardrails, fence posts and railwav ties.

Oil filters are crushed (with the residual oil captured) and processed by metal recyclers for manufacturing into industrial materials such as rebar.



CROSS-CANADA COLLABORATION

ARMA has been working with the other provincial programs to identify and register original equipment manufacturers (OEM) in the applicable used oil materials recycling program in order to ensure a level playing field with all suppliers of eligible oil materials across Canada. This year 25 new OEM suppliers have been registered in Alberta's program with the work ongoing to identify applicable companies in categories such as construction equipment, agriculture, automotive, and forestry equipment.

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.











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