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Fall 2021
Solid Waste Forecast

Executive Summary

November 2021

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Forecast Summary

Despite the economic headwinds this past quarter associated with rising Delta infections, inflation worries and supply chain difficulties, regional waste volumes continue to grow.

Economics

Gross Domestic Product: The US economy registered annual real GDP growth of 6.5% in the first half of the year, but growth is expected to slow substantially. IHS Markit estimates that real GDP in Q3 grew a mere 1.4%, annualized , curtailed by the onset of the Delta variant of COVID-19. GDP decelerated sharply in the last quarter due to 1) a sharp downturn in consumer confidence, 2) a deceleration in consumer service spending, 3) heightened inflation worries, 4) and prolonged supply-chain difficulties and lenthened delivery delays. The strains on the economy are expected to then begin easing in Q4 as infection rates continue trending lower. Inflation concerns will abate as supply-side problems are overcome by improved production. Consumer confidence will improve sharply and lift real spending and GDP as pandemic concerns fade. The recovery is merely delayed and growth shifted into next year. The current forecast from our macroeconomic advisor has GDP growing at 5% next year, up from a prior estimate of 4.3%.

COVID recovery: The emergence of the Delta variant forced a pause in economic growth this summer. Consumer spending declined sharply while infection rates climbed. IHS Markit estimates the US vaccination rate is now up to 66% of eligible residents from 56% at the end of June. Bioscience experts say that because of the more virulent nature of the Delta strain of COVID, the proportion of people that should be vaccinated to reach *herd immunity* could be upwards of 80%, a revision from a 67% threshold for widespread protection. Experts anticipate the wider spread of vaccinations will inch the nation closer to *herd immunity* and more normal growth.

Fiscal stimulus: Greater policy risk and uncertainty is attributed in the October US macroeconomic forecast. The forecast incorporates a modest economic boost from assuming the enactment of the Infrastructure Investment and Jobs Act (IIJA), although it appears that passage may be less certain than assumed by the current macro outlook. The US outlook has yet to include the economic impact of the Build Back Better (BBB) plan as its enactment is far less certain.

Consumer sentiment and PCE: In the first half, consumer confidence and spending soared with one-time economic stimulus payments to households. This summer, consumer sentiment plunged deeply as the nation faced the 4th COVID wave and consumer spending on service items rapidly decelerated. Confidence topped its highest reading in the COVID-era in April of this year, but has since fallen off -19.1% since its peak. Personal consumption expenditure (PCE) hit 12% annual growth in Q2, but is only expected to grow 0.4% in Q3. We expect confidence to rebound quickly as pandemic concerns wane, thus boosting service sector spending and strengthening the return to normal economic activity in socially-dense industry sectors.

Forecast Summary

FED monetary policy: Central bankers will meet during the first couple days in November. The committee is expected to begin tapering its program of Large Scale Asset Purchases (LSAP). Pundits say the FED will likely start by cutting about $20 billion from the $120 billion per month purchase of Treasury and mortgage-backed securities. The FED will likely wind down monthly purchases within a year after beginning the taper process, although the exact timing has not yet been announced. Because of the heightened near term inflation outlook, our macro advisor advanced *lift-off* of interest rates to March 2023 from September 2023. The consumer inflation outlook is elevated in the current forecast and extends out several more quarters than in the prior forecast. Greater production costs and material shortages have increased the price of goods (and services) at the retail level and higher prices are being passed on to consumers. As a result, the sentiment of some FED members has shifted and now more are inclined to raise interest rates sooner rather than later. The FED has made no anouncement of interest rate hikes, only a set of conditions they want see met in the economy before doing so.

US Employment outlook: Despite unexpected easing of job gains in August and September, due to Delta variant concerns, the employment recovery remains intact. Initial claims for unemployment insurance continues a declining trend. The shortages in the labor market should continue easing as the unemployment rate continues to ratchet lower. The nation has roughly recovered about 3/4 of job losses suffered during the pandemic. Employment will continue edging back to its pre-pandemic peak, with payroll employment reaching its pre-pandemic peak is Q3 of 2022 and maximum employment attained by early 2023.

Mortgage interest rate: The FED successfully drove yields lower since the pandemic's onset. The 30-year fixed-rate mortgage yield hit an all-time low of 2.68% in December 2020. The rate had increased 30 basis points to 2.98% by June, but has since eased to 2.84% in August but edged up to 2.9% for September. The increase is likely due to the rise inflation and anticipation of an inflection in monetary policy direction. Mortgage rates will rise gradually but remain historically low, reaching 4% only after “lift off". Historically low interest rates will help towards housing affordability, while contributing to stronger demand from first-time homebuyers.

Housing: Home price inflation continues to accelerate. Since we began forecasting the solid waste generation on a quarterly frequency, home prices have exceeded forecast expecations each time. Our macro-economic advisor once again elevated the forecast for single family home prices. Higher home prices have begun to influence the rental market too. Since July, rents have been firming and accelerating across the nation, according to national CPI data on rental property. In the MSA, rents began accerating even sooner. Since October of a year ago , according to extrapolated Zillow data, rents in the Portand region have risen 9%. In about the same time frame, according to RMLS data, home prices rose 13.1% since year ago September. RMLS's median sales price in the region peaked at $525,000 in August, and eased to $510,000 in September. However, we must caution that 1-month of data do not make a trend, but we could be seeing the start to slower price growth.

Forecast Summary

Regional employment trends: The regional jobs recovery, despite recent slowing in GDP, is still undeterred. A couple sectors have made it back to pre-pandemic levels (wholesale trade and information services), while a few have surplassed it (construction, transporation and warehousing [TWU], business services, and the temporary service industry). The manufacturing sector, still underwater, has started making a comeback since late-spring, led by a surge in the high-tech electronics sector. The sharpest increase in employment was found in the leisure & hospitality sector; this isn't a surprise since it was hit hardest by the government ordered lockdowns, and re-opening of the economy has allowed a bounce back. Still, the sector is still much underwater, with about 20,000 jobs still to make up. In total, payroll employment has made up 71% of lost jobs since the pandemic. Projected payroll employment is still on track and we expect that it will make a full rebound by mid-2023, the pace lagging the US by about a year.

Construction sector: The resiliency of the construction sector is a credit to the industry's ability to find work arounds to pandemic restrictions. MSA construction jobs are nearly 5,000 jobs above pre-pandemic employment. Remarkably, the industry's employment increase is second only to business services which is now 5,800 higher. We anticipate the industry will continue to advance as long as the backlogged housing demand persists and that housing is attainable for many households while interest rates remain near historical lows.

Forecast risk: Risk alternatives change rapidly in this COVID era. The virus remains in charge and can change expecations rapidly as has been the case with the emergence of the Delta variant. Political wrangling over the US debt ceiling, uncertainty over the prospects of infrastructure investment bills, and the Delta variant tilts uncertainty in the current forecast in a more pessimistic direction. The risk for the baseline forecast could lean toward slower growth in coming quarters because of the aforementioned uncertainties.

Forecast Summary

Solid Waste

Regional Waste Outlook: As economic growth slowed this past quarter (Q3, 2021) due to a variety of issues affecting consumers, regional waste volumes naturally followed suit. Garbage volumes slowed from a relatively quick 2.5% annualized growth in the second quarter, to about 1.5% in the third. Despite this deceleration in growth, regional garbage continues to grow and grow much faster than we anticipated in our forecast last Fall. This time last year, we were expecting regional tonnage of about 1.44 million by the end of calendar year 2021. Now however, we should see about 1.48 million in 2021, and about 1.55 million in calendar year 2022. Tonnage is now well past its pre-recesssion peak, and should continue to grow through the end of calendar year 2023. After 2023, a couple assumptions induce a change to the outlook, which will be "firmed up" in successive forecasts. First, home price appreciation is expected to slow considerably while mortgage rates begin to lift off from their historically low levels. These factors will put pressure on household wealth, causing waste generation to move sideways. And second, the Business Food Waste Program is expected to capture a significant amount of food waste from the garbage stream.

Waste Recovery: These two regimes (a slowing economy timed with increased food waste recovery) have been a staple in our forecast over the last several quarters and so should not be news. The differences in this forecast however, relate to the assumptions around the timing of the additional recovery. Our forecast last fall assumed a slightly earlier, but much slower implementation of recovery coming from the generator groups. Now, the assumption is that the two largest business generator groups - Group 1 and Group 2 - are expected to be in compliance with the Program's requirement to recover food by Fall of 2023 all at once. To be clear, a later, but more severe onset of additional capture than was expected in the forecast last fall.

Wet Tonnage Allocations: As a matter of policy, Metro allocates up to 60% of the available putrescible (wet) waste to private transfer stations after allocating a small portion of tonnage to haulers and generators that wish to deliver waste directly to Covanta Marion waste-to-energy facility. Our assumption for this forecast is the same as it was last fall, which is to assume the full 60% allocation of waste to private facilities, plus some expected under-use of those allocations (around 1%, or 99% use). This should ensure that Metro transfer stations receive at least 40% of the regional wet waste in calendar year 2022 and beyond. As we've been reporting now for the last couple quarters, our fall 2020 forecast of regional wet tonnage volumes, which set the current calendar year 2021 tonnage allocations, is running a little low. We expect tonnage to come in around 30,000 higher this calendar year than we expected last fall. As a result, Metro's should receive about 43% of the waste in calendar year 2021.

Post-collection Recovery: While waste recovery "pre-collection" is expected to expand with the Business Food Waste Program, the same can't be said of recovery after collection, particularly recovery of mixed dry waste. While some facilities exhibit higher mixed dry waste recovery rates than others, average rates across facilities are sitting at about 16%, where they are expected to remain through the forecast horizon.

Forecast Flash

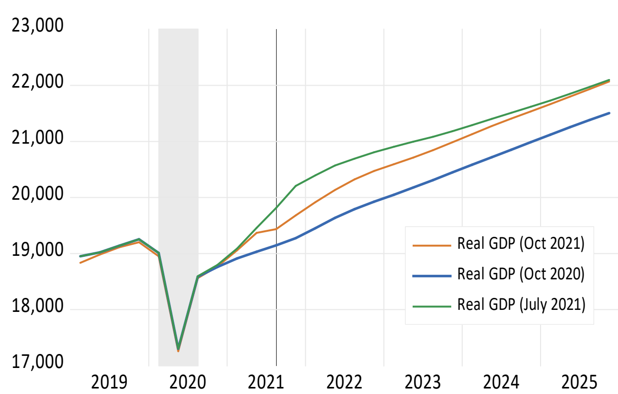
	Calendar Quarter					Calendar Year			
	2021:3	2021:4	2022:1	2022:2	2022:3	**2020**	2021	2022	2023
Key Economic Drivers (seas-adj)									
Consumer Sentiment Index	75	76	82	85	91	82	79	88	94
change (%)	*(12.6)*	*2.3*	*6.9*	*4.2*	*7.3*	*(15.0)*	*(2.8)*	*11.0*	*7.3*
*change from fall fc (%)**	---	---	---	---	---	---	---	---	---
Home Prices (real)	128	132	134	135	136	113	126	135	138
change (%)	*2.6*	*2.8*	*1.3*	*0.9*	*0.8*	*6.5*	*12.1*	*7.1*	*2.2*
*change from fall fc (%)**	---	---	---	---	---	---	---	---	---
Mortgage Rates (real)	2.73	2.85	3.06	3.23	3.43	3.08	2.82	3.32	3.88
change (%)	*(4.9)*	*4.3*	*7.3*	*5.7*	*6.0*	*(20.8)*	*(8.5)*	*17.9*	*16.6*
*change from fall fc (%)**	---	---	---	---	---	---	---	---	---
GDP (real, $T)	19.4	19.7	19.9	20.1	20.3	18.4	19.4	20.2	20.8
change (%)	*0.3*	*1.3*	*1.2*	*1.1*	*0.9*	*(3.4)*	*5.4*	*4.3*	*2.8*
*change from fall fc (%)**	---	---	---	---	---	---	---	---	---
Construction:Total Emp (ratio)	6.5	6.5	6.5	6.4	6.4	6.4	6.4	6.4	6.3
change (%)	*0.7*	*0.1*	*(0.2)*	*(0.6)*	*(0.1)*	*4.1*	*(0.1)*	*(0.1)*	*(2.3)*
change from fall fc (%)	*3.3*	*2.8*	*2.8*	*2.3*	*2.3*	---	*2.4*	*2.2*	*0.1*
Home Permits (4QMA, thous)	3.8	4.0	4.2	4.0	4.0	15.0	14.4	16.3	15.9
change (%)	*8.2*	*5.3*	*4.5*	*(3.2)*	*0.0*	*(3.7)*	*(4.4)*	*13.4*	*(2.3)*
change from fall fc (%)	*11.7*	*17.7*	*24.0*	*22.0*	*22.5*	---	*6.6*	*22.8*	*15.1*
Tri-County Core Tons *(thous)*	388	361	365	398	409	1,411	1,477	1,546	1,564
yoy change (%)	*6.1*	*0.5*	*4.4*	*5.0*	*5.5*	*(2.3)*	*4.7*	*4.7*	*1.1*
change from fall fc (%)	---	*3.1*	*5.6*	*5.7*	*5.6*	---	*2.4*	*5.6*	*4.3*
Wet Tons Avail. For Alloc. *(thous)*	192	198	189	196	196	715	758	779	776
yoy change (%)	*6.2*	*6.7*	*4.6*	*4.1*	*2.3*	*(3.1)*	*6.0*	*2.7*	*(0.3)*
change from fall fc (%)	---	*6.9*	*6.3*	*6.4*	*6.4*	---	*4.1*	*6.4*	*3.6*

	Calendar Quarter					Fiscal Year (ending)			
	2021:3	2021:4	2022:1	2022:2	2022:3	**2021**	2022	2023	2024
Metro Enterprise Tons									
MSW (thous)	145	130	134	145	147	545	554	568	567
yoy change (%)	*11.4*	*(1.1)*	*(2.6)*	*0.1*	*1.2*	*10.0*	*1.8*	*2.5*	*(0.2)*
change from fall fc (%)	---	*(2.2)*	*3.4*	*3.7*	*3.8*	---	*2.2*	*2.8*	*0.9*
Res. Organics (thous)	9.8	14.6	8.5	15.9	11.2	51.2	48.8	48.2	48.2
Com. Organics (thous)	3.0	1.8	2.6	2.7	3.0	11.9	10.1	12.9	20.6
Wood (hunds)	5.6	6.4	5.4	6.3	7.2	26.7	23.7	24.5	24.5
Yard debris (thous)	3.8	3.9	3.4	6.6	4.6	20.5	17.7	19.2	19.2
Staffed (thous)	104	78	84	111	116	380	377	399	402
Automated (thous)	30	27	27	30	30	113	114	117	119
Regional Fee/Tax Revenue Tons									
Regional System Fee (thous)	386	358	366	390	398	1,437	1,500	1,538	1,540
yoy change (%)	*7.5*	*0.1*	*5.8*	*4.1*	*3.0*	*3.0*	*4.4*	*2.6*	*0.1*
change from fall fc (%)	---	*3.4*	*6.9*	*7.2*	*7.3*	---	*5.7*	*6.6*	*4.9*
Excise Tax (thous)	390	364	370	395	404	1,456	1,520	1,559	1,561
Environmental Cleanup (thous)	70	66	66	70	79	230	273	292	304
Community Enhancement (thous)	300	270	272	306	300	1,115	1,148	1,172	1,174

* These are new features in our model this quarter, and have no corresponding Fall 2020 vintage

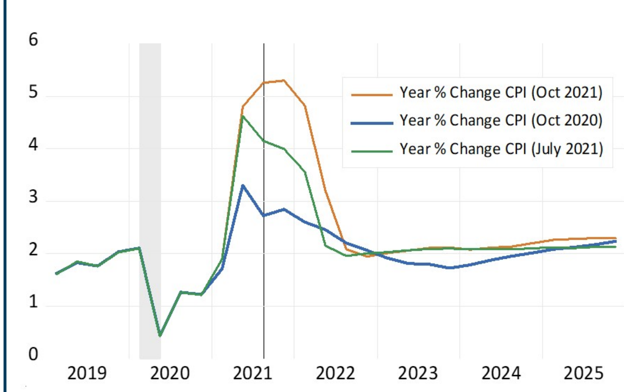
Forecast Flash

GDP pace falters in Q3 on 4th COVID wave, but recovery still intact



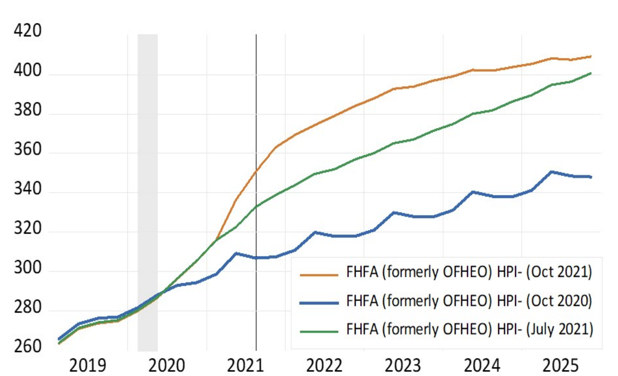
Source: Bureau of Economic Analysis, IHS Markit

Higher inflation induces a Fund Fund rate "lift-off" sooner than expected



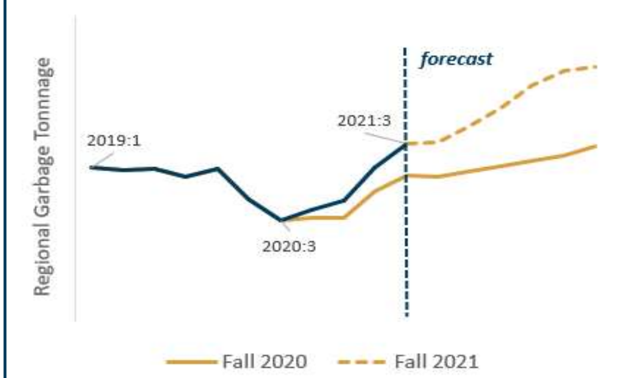
Source: US Federal Reserve, IHS Markit

Elevated home price appreciation adds to household and consumer wealth



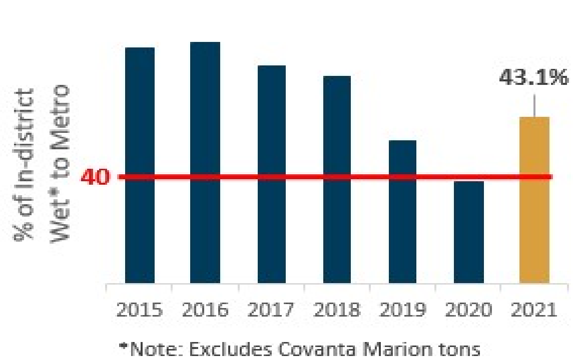
Source: Federal Housing Finance Agency, IHS Markit

COVID-induced declines turned in Q3 2020 as expected, but growth has been faster



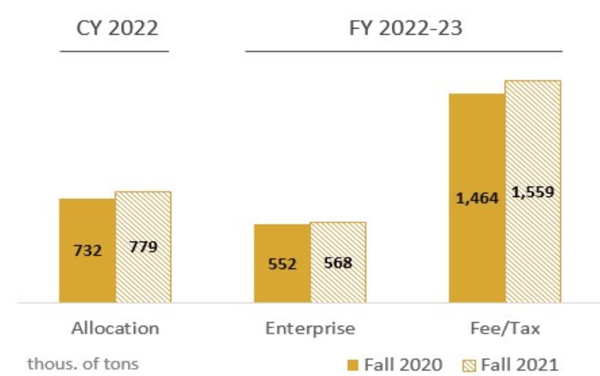
Source: Metro

More wet waste than expected ensures Metro stations receive more than 40%



Source: Metro

Current outlook for next calendar and fiscal years better than last Fall across the board



Source: Metro

Key Assumptions

	Baseline Assumption	Change from Fall Forecast
Bioscience/Vaccine	The fourth wave of COVID (i.e., Delta variant) peaked in Q3, but unlike prior waves, containment measures did not make a comeback. US vaccinations continue climbing, up to roughly 67% at the end of the Q3 from about 56% at its start. By these measures, herd immunity is on track and should be reached by the end of this year or early next year.	The US vaccination campaign is estimated to have inoculated over 56% of Americans. The pace is beginning to slow, but experts believe 90% of Americans can be vaccinated near the end of the year. The delta variant of the virus now poses the biggest threat to the unvaccinated population and risks targeted economic shutdowns of local areas in the US to contain the outbreak.
US Macro	GDP growth stalled as the Delta variant emerged to quash consumer confidence. The Delta variant, prolonged supply-chain difficulties, delivery delays and elevated CPI inflation combined to lower real GDP and consumer spending this quarter. US growth will slow in the second half from the first, but will emerge stronger in 2022. Expect Q4 GDP to rebound sharply, and the Q3 pause in growth shifted into the GDP in 2022.	The GDP outlook in the July IHS Markit forecast is elevated over April. It believed that the US some time in June crossed over its pre-pandemic peak. The forecaster anticipates heightened consumption spending in the 2nd half of this year and modestly accelerated growth for all of 2022. CPI inflation has become a worry due to consumer spending outpacing goods production, but inflationary expectations for now seem well-anchored.
Fiscal Stimulus	Q3 saw the impact of one-time federal stimulus payments wane and the end to pandemic era unemployment benefits. This forecast assumes enactment of the Infrastructure Investment Jobs Act (IIJA). Its impact on the economy adds up to 0.5% more to real GDP by the middle of the decade and then tapers. The Build Back Better (BBB) fiscal proposal has <u>not</u> been included as yet due to the uncertainty of its passage.	The fiscal stimulus paid to US households in January and March have been spent down by housholds and its impact on GDP has begun to wane. Additionally, pandemic-era unemploment benefits will sunset at the beginning of Sep. This forecast does not include any infrastructure spending proposal(s) due to political uncertainty. The recovery is on solid footing and seems less likely to need any additional boost.
Monetary Policy	The FED meets in early November and is expected to begin tapering large-scale asset purchases (LSAP), and to conclude by the end of 2022. Soaring energy prices, higher production costs, and higher home prices/ rents are adding to the surge in CPI inflation. As a result, the macro assumption for initial FED "lift-off" of the federal funds rate was moved up to March 2023, 6 months sooner. Still, there is widespread belief that long-term inflationary expectations will remain well anchored near the 2% target.	The FED is likely to begin talks soon to reduce its LSAP support from $120B/month. They could lower the monthly purchases of US Treasuries and mortgage-backed securities together or assume a dual track buy down. Due to the recent rise in inflation & elevated GDP growth, FED members have revised up their economic forecasts. Some have said it is appropriate to raise the target FED Funds rate starting in mid-2023. This is a year earlier than previous assumed.

Key Assumptions

	Baseline Assumption	Change from Fall Forecast
Home Prices	The outlook for US residential home prices was again elevated as prices continued to soar. Inflationary home prices crossed over into the rental market this summer as rents started rising sharply beginning in July and has shown no indication of slowing. The latest month's FHFA s home price readings on the other hand showed signs of softening for the first time in nearly 2 years. This might be the start to slower home appreciation as more homebuyers get pushed out of the market.	Residential prices are expected to rise even faster this year in the July forecast. Housing production is modestly elevated over the April forecast, but more robust housing demand drives home prices to trend higher and faster. Years of pent-up demand and historically low interest rates fuel a strong uptick in prices for several more years in the future.
Construction	Construction activity will be bolstered by residential production for some time. Favorable demographic fundamentals will continue to propel the industry in the near term. Historically low interest rates will continue to bolster housing demand, but with home prices elevating so quickly, we forecast eventual slowing as more and more prospective homeowners get squeezed out of the market.	Harsh winter conditions forced builders to tap the brake this year, but once again, the industry was able to shrug aside the bad. Sector jobs in the MSA bounced back rapidly, showing its resiliency. The job sector was only 1 of a handful of sectors in the MSA that finally crossed over pre-pandemic employment levels. Favorable market fundamentals will continue to propel the industry for the foreseeable future.
Commercial Food Waste	The Business Food Waste Program enforcement deadlines pushed out; Groups 1 and 2 will need to be in compliance by Fall 2023; Group 3 by Fall of 2024	Lower near-term capture, higher later
Residential Food Waste	Capture remains elevated at about 133,000 tons per year; no new curbside programs assumed in forecast	Higher capture through horizon
Wet Waste Allocations & Utilizations	Allocations at 60% (plus 4-5 K to Covanta Marion), utilizations at 99% in each calendar year through horizon.	No change

Key Assumptions

	Baseline Assumption	Change from Fall Forecast
Mixed dry and food waste market shares at Metro facilities	No expected firm entry/exit for mixed dry waste or source-separated organics.	Mixed dry waste shares at Metro higher through horizon
Pre-consumer wastes and Environmental Cleanup	Tons of pre-consumer (special) wastes that incur Metro's full fee and tax at disposal sites are expected to move sideways through 2022 and grow moderately thereafter. Environmental cleanup materials, which incur reduced Metro fees and taxes, are expected to grow moderately but steadily through horizon.	Lower near-term, higher later
Post-collection Recovery	No major new market or policy developments increase rates. Recovery rates stabilize at about 16% through horizon.	Lower rates through forecast horizon