Comments on the Office of Financial Management's Fiscal Note on I-732

January 28, 2016

Background: Initiative 732 was designed to be "revenue-neutral", meaning that the revenue from the carbon tax is balanced by reductions in existing taxes: a one point reduction in the sales tax, a Working Families Rebate to benefit low-income households, and a reduction in the Business & Occupation tax for manufacturers.

Summary: The Office of Financial Management has released its Fiscal Note for I-732, concluding that the combined tax reductions are about $900 million greater than the carbon tax revenue over the first four years of the policy. We have identified several major issues with the OFM analysis. *Correcting three of the largest problems essentially fills the OFM funding gap.* Our analysis shows that I-732 will be revenue-neutral, or even slightly revenue positive, over the first four years of the policy.

Details: Here is a summary of the OFM analysis of I-732:

Fiscal year	2018	2019	2020	2021
Carbon tax revenue	$1,455m	$1,972m	$2,090m	$2,189m
Sales tax reduction	(684)	(1,505)	(1,652)	(1,730)
B&O tax reduction	(382)	(438)	(461)	(485)
Working Families Rebate	(420)	(279)	(288)	(296)
Revenue difference	(31)	(250)	(311)	(322)

Some of the issues with their analysis are:

Issue #1: Does Not Tax Exported Power
I-732 applies the carbon tax to exported power, i.e., electricity that is generated in Washington State but sold elsewhere. The Carbon Tax Assessment Model (CTAM) that OFM used to estimate the carbon tax revenue is based on energy consumption, not production, and therefore excludes exported electric power. OFM ignored this missing revenue. ***4-year revenue increase: about $376m***

Issue #2: Incorrect Tax Rate for Unspecified Power
The amount of tax that I-732 levies is based on the carbon content of each fossil fuel. Power utilities report the source of at least some of their electricity as "unspecified", which I-732 taxes at a higher rate than the one used in CTAM. OFM did not adjust its analysis for this discrepancy. ***4-year revenue increase: about $324m***

Issue #3: Incorrect Implementation of the Working Families Tax Exemption

The Working Families Tax Exemption (WFTE) is based on calendar years, not fiscal years. Instead of a 15% WFTE for fiscal year 2018 and a 25% WFTE thereafter, OFM incorrectly assumes a 15% + 25% = 40% WFTE for fiscal year 2018 and a 25% WFTE thereafter. ***4-year expenditure decrease: about $260m***

Issue #4: Ignores Growth in the Sales Tax Base
Imposing a carbon tax increases the cost of producing some goods and services, so some consumer prices will also rise. Although there will be an offsetting reduction in the amount of sales tax that consumers pay, the net effect will be to increase the size of the sales tax base, just as it would with a restaurant that moved from 10% tips to a fixed 10% service charge. A larger sales tax base means more sales tax revenue, but OFM did not include this revenue in its analysis. ***4-year revenue increase: about $142m***

Issue #5a: No Adjustment for Relative Population Growth
CTAM assumes Washington emissions will be a fixed share of Pacific Region emissions, but in fact Washington's share will grow because of relative population growth. The analysis underestimates carbon tax revenue as a result. ***4-year revenue increase: about $156m***

Issue #5b: Ignores Effect of California Carbon Policies
Besides the effects of relative population growth, Washington's share of Pacific Region emissions will also grow because of reductions in California emissions due to the carbon pricing policies that they have recently enacted, such as AB32 (the Global Warming Solutions Act) and a Low Carbon Fuel Standard. CTAM does not currently account for this factor. ***4-year revenue increase: up to $939m***

Total revenue increase from these changes: about $960m - $2,197m.

Fiscal Impact of Taxing Exported Electricity in I-732

January 28, 2016

The CTAM analysis done by the state uses a consumption-based model of carbon emissions, meaning that it counts *imports* (notably, electricity that is generated elsewhere but consumed in Washington) but does not count *exports* (electricity that is generated in Washington but consumed elsewhere). In contrast, I-732 taxes the carbon content of imported power *plus* all fossil fuels burned in Washington, including for power that is exported. So the CTAM revenue estimate needs to be augmented to account for emissions associated with exported electricity.

Most generated electricity is delivered to the grid, so it isn't possible to know exactly what is consumed in-state and what is exported. We therefore make the following assumptions:

- Coal and natural gas generation in Washington State remain constant (at the average for 2012-2013, the most recent years for which data are available) except that Centralia Unit 1 is replaced with new natural gas generation on December 31, 2020. *This is per the TransAlta MOU.*
- 50% of electricity generated at TransAlta's Centralia Coal Plant (Centralia) is exported. *This is an assumption taken directly from CTAM (row 105 of "Baseline Emissions" tab).*
- 20% of electricity generated from natural gas in Washington is exported.
- Carbon emissions for coal and gas are taken (from CTAM) to be 94.70 and 53.06 $MMTCO_2$ per quadrillion BTUs, respectively.
- When TransAlta Unit 1 is retired, the reduced contribution of coal generation to exported electricity is replaced by a sufficient increase in gas generation to keep fossil-based exports constant.

Revenue from exported electricity amounts to **$375.8 million** over four years:

Fiscal Year	2018	2019	2020	2021
Carbon tax rate	$15.00	$25.00	$26.40	$27.90
Coal burned in WA (QBTUs)	0.074	0.074	0.074	0.055
Coal-based exports (QBTUs)	0.037	0.037	0.037	0.028
CO2 from coal exports (MMTCO2)	3.50	3.50	3.50	2.62
Carbon tax on coal exports	$52.4m	$87.4m	$92.3m	$73.1m
Gas burned in WA (QBTUs)	0.067	0.067	0.067	0.079
Gas-based exports (QBTUs)	.013	.013	.013	.016
CO2 from coal exports (MMTCO2)	0.71	0.71	0.71	0.84
Carbon tax on gas exports	$10.7m	$17.8m	$18.8m	$23.3m
Total carbon tax on exports	$63.1m	$105.2m	$111.0m	$96.5m

Fiscal Impact of Taxing Unspecified Electricity in I-732

January 28, 2016

Electric power consumed in Washington State comes with an "e-Tag" from either a specified source (e.g., a given wind farm or natural gas plant) or from the Mid-Columbia ("Mid-C") trading hub. A variety of generating facilities serve Mid-C, but the specific e-Tags associated with those generating facilities disappear "in the mix" at Mid-C: the e-Tags for power purchased from Mid-C simply list Mid-C as the source.

In Washington's Fuel Mix Disclosure Reports these Mid-C purchases are listed as "unspecified" and the associated carbon content is assumed to be the "Northwest Power Pool Net System Mix", which during 2011-2014 averaged 38.2% coal, 13.5% natural gas, and 48.3% non-fossil (principally hydropower and nuclear). Confusingly, utilities in Washington State can also report specified power as being "unspecified"—notably, Pacific Power reports *all* of the ≈4.5m MWh of power it sells annually in Washington as being "unspecified", while in Oregon it reports less than 10% as being "unspecified"—but the Net System Mix calculation apparently attempts to resolve these issues to the maximum extent possible.

In 2014 power reported as "unspecified" accounted for 15.8% of electricity consumption in the state, or 14.5m MWh. This unspecified power is relevant for the section of the state's CTAM analysis that relates to the fuel mix (the percentage of electric power coming from coal, natural gas, hydro, and other sources). In particular, CTAM uses a 5-year historic average to project a fuel mix for 2018-2020 of 15.1% coal, 9.6% natural gas, etc. (These numbers are on the "FMD Historical" tab of the Energy-Forecast-3-1c.xlsx spreadsheet, from whence they influence the "electricity" tab and then the "consumption forecast" tab, which gets copied and pasted into the "Baseline consumption" tab of the main spreadsheet, CTAM-3-1c-for-web.xlsx.) *In doing so CTAM uses the Net System Mix to represent unspecified power.*

While CTAM accounts for unspecified power using the Net System Mix, I-732 taxes unspecified power at 1 metric ton per MWh, an assumption that basically treats all unspecified power as coal. (The rationale was to prevent fossil fuel generators from "laundering" their power by selling it through Mid-C.) Carbon tax revenue under I-732 will therefore be higher than estimated with CTAM: every MWh of unspecified power that is treated by CTAM as the Net System Mix (38.2% coal, 13.5% natural gas, and 48.3% non-fossil) will be taxed under I-732 as 100% coal. *The net effect is to more than double the carbon emissions—and carbon tax revenues—associated with unspecified power.*

Using the numbers for 2014, for example, 14.5m MWh of unspecified power would be taxed as 14.5m tons of CO2 under I-732, so revenue at $25 per ton would be $362.5m. Under the CTAM approach this 14.5m MWh is treated as ≈38.2% coal (which at 1 ton of CO2 per MWh works out to 5.5m tons of CO2), ≈13.5% natural gas (which at 0.5 tons of CO2 per MWh works out to 1.0m tons of CO2), and 48.3% non-fossil (i.e., 0 tons of CO2), so revenue at $25 per ton would be only $162.5m.

An accurate assessment of carbon tax revenues under I-732 will depend on two additional factors. One is the extent to which utilities will be able to specify *as non-coal* power that is currently "unspecified". There is an obvious financial incentive to do so—anything that is not coal will be taxed at a lower rate if it is specified—and there is clearly some potential to do this, especially for Pacific Power and for firms that can use bilateral contracts to avoid using the Mid-C spot market. But there are also limits: bilateral contracts are difficult for intermittent resources like wind and solar, there are systems benefits to having a robust spot market, Mid-C is not currently technically able to convert "unspecified" power into specified power, etc.

The second factor—which points in the opposite direction—concerns double-taxation. Although I-732 attempts to avoid this (see section 5(4)), the potential exists for double-taxation of electricity that is generated in Washington State and then consumed in Washington State after being sold on Mid-C as "unspecified": it will be taxed once when fossil fuels are burned to generate the electricity, and then taxed again upon consumption because at Mid-C it will be sold as "unspecified" and consequently the buyer will be unable to prove that the carbon tax was already paid.

We believe that these two factors together will lower carbon tax revenue associated with unspecified emissions by 20% in 2018 and 2019 and by 40% in 2020 and 2021. (Note that the maximum possible percentage here is about 55% because this results in approximately the same amount of carbon tax revenue as you'd get from the Net System Mix if it were all specified in accordance with that fuel mix.)

Our estimate is that this issue will change the 4-year fiscal impact by $323.5m.

Fiscal Year	2018	2019	2020	2021
Unspecified emissions (estimated, million MWh)	14.5	14.5	14.5	14.5
Associated CO2 under I-732	14.5	14.5	14.5	14.5
Adjustment	-20%	-20%	-40%	-40%
Adjusted CO2 under I-732	11.6	11.6	8.7	8.7
Associated CO2 under Fuel Mix rules (MMTCO2)	6.5	6.5	6.5	6.5
Difference (MMTCO2)	5.1	5.1	2.2	2.2
Carbon tax rate	$15.00	$25.00	$26.40	$27.90
Revenue difference	$76.5m	$127.5m	$58.1m	$61.4m

An alternative approach (see next page) yields a 4-year fiscal impact of $752.8m.

Alternative approach

We begin with estimates of the impact to unspecified power revenue due to the 1 tCO_2/MWh assumption in I-732 (total 4-year impact is $**489.6m**):

Fiscal Year	2018	2019	2020	2021
unspecified electricity before I-732 (mm MWh)	14.5	14.5	14.5	14.5
reduction due to 20% (or 40%) becoming specified	20%	20%	40%	40%
Resulting unspecified electricity (million MWh)	11.6	11.6	8.7	8.7
$MMTCO_2$ with CTAM approach of Net System Mix	5.6	5.6	4.2	4.2
$MMTCO_2$ with I-732 approach of 1 ton/MWh	11.6	11.6	8.7	8.7
difference ($MMTCO_2$)	6.1	6.1	4.5	4.5
carbon tax rate	$15.00	$25.00	$26.40	$27.90
revenue increment	$91.0m	$151.6m	$120.1m	$126.9m

Now we add an estimate of taxes collected at the generator on domestic unspecified power as a result of the double-taxation issue described above; we assume that 50% of the carbon emissions associated with the resulting unspecified electricity is generated in-state. (total 4-year impact is **$263.2m**):

Fiscal Year	2018	2019	2020	2021
Resulting unspecified electricity (from above, million MWh)	11.6	11.6	8.7	8.7
Fraction generated in-state	50%	50%	50%	50%
Resulting unspecified electricity generated in-state (million MWh)	5.8	5.8	4.4	4.4
of which, coal-fired	2.3	2.3	1.7	1.3
of which, gas-fired	0.9	0.9	0.7	0.9
Emissions from generation				
coal ($MMTCO_2$)	2.3	2.3	1.7	1.3
gas ($MMTCO_2$)	1.2	1.2	0.9	0.7
Carbon tax revenue				
from coal generation	$34.9m	$58.1m	$46.0m	$36.5m
from gas generation	$17.4m	$29.0m	$23.0m	$18.2m
total	$52.3m	$87.1m	$69.0m	$54.7m

The two effects combined add **$752.8m** to the anticipated CTAM-based estimate for I-732 revenue collection.

Implementation of the Working Families Tax Exemption in I-732

January 28, 2016

The Working Families Tax Exemption (WFTE) is based on calendar years: a 15% WFTE in 2017 and a 25% WFTE in 2018 and beyond. The state budget, however, is based on fiscal years (e.g., fiscal year 2018 is the year ending June 30, 2018). In translating the WFTE into fiscal year terms, OFM incorrectly assumes that fiscal year 2018 will include both a 15% *and* a 25% WFTE, for a 40% total WFTE with a cost of $421 million. This is counter to the intent of Carbon Washington and the language of I-732. Using a 15% WFTE for FY 2018 instead of a 40% WFTE is a **difference of $262.9m in fiscal year 2018**.

The relevant legal language is here, but here's the key bit: "For 2017, the working families' tax exemption for the prior year is equal to the greater of fifteen percent of the credit claimed and claimable under Title 26 U.S.C. Sec. 32 of the federal internal revenue code in the most recent year for which the applicant has filed a federal income tax return with the internal revenue service or one hundred dollars."

We have a very strong case that this is calendar year 2017 and that this 15% rate should be attributed to FY 2018. Here's why:

1) Our legal language defines "year" as follows: *"Year" means the twelve-month period commencing January 1st and ending December 31st unless otherwise specified.*

2) Perhaps more importantly, the WFTE RCW that we are amending (RCW 82.08.0206) sits within Chapter 82.08 RCW and the definitions in that chapter (in RCW 82.08.010) include this: *The meaning attributed in chapter 82.04 RCW to the terms "tax year," "taxable year," [etc] applies equally to the provisions of this chapter.* And in chapter 82.04 RCW we find this definition in RCW 82.04.020: *"Tax year" or "taxable year" means either the calendar year, or the taxpayer's fiscal year when permission is obtained from the department of revenue to use a fiscal year in lieu of the calendar year.*

So it is clear that the "2017" in our legal language references *calendar* year 2017 and not *fiscal* year 2017.

Our interpretation, therefore, which was also our intent when we drafted the bill, is as follows: people file their 1040s for 2016 by April 15, 2017, and then send a copy to DOR as part of their WFTE application. DOR processes those applications in the summer and fall of 2017 and then makes payments by the end of the 2017 calendar year (i.e., in FY 2018). This seems straightforward.

The interpretation suggested by the state (that the 15% rate applies to FY2017 but DOR can't process payments in FY2017 so they're applying the 15% rate to FY2018 and then also applying a 25% rate to FY2018) seems much less straightforward: We *know* that 2016 taxes aren't due until April 15, 2017, and it's pretty implausible to think that we intended for people to send a copy to DOR *and* have DOR process

those applications *and* have DOR make payments, *all* by the end of FY2017 on June 30, 2017.

The original language of the WFTE is also suggestive. The original bill (which was never funded) was passed in January 2008 and says this: *For remittances made in 2009 and 2010, the working families' tax exemption for the prior year [etc.]… The department shall begin accepting applications October 1, 2009.* Obviously it's not possible to make payments in FY2009 when applications aren't accepted until October 1, 2009, because that date is in FY2010.

Correcting this issue will reduce the 4-year fiscal impact by $262.9 million. (If a 40% rate costs $420.6 million then a 15% rate will cost only $157.7 million.)

Fiscal Year	2018	2019	2020	2021
OFM 1-24 WFTE	$420.6m	$279.1m	$287.5m	$296.2m
Adjusted revenue	$157.7m	$279.1m	$287.5m	$296.2m
Revenue difference	$262.9m	-	-	-

Fiscal Impact of the I-732 Tax Shift on the Sales Tax Base

January 28, 2016

Consider a simplified world in which all carbon emissions are associated with consumer activity, e.g., buying fuel for your car. In this simplified world, replacing part of the state sales tax with a carbon tax *is not* going to have a significant impact on the sales tax base. (There are some elasticity effects that come from lowering the sales tax, but these are likely to be small.)

But now consider the other extreme, a simplified world in which all carbon emissions are associated with business activity, e..g, buying fuel for delivery trucks. In this world, replacing part of the state sales tax with a carbon tax *is* going to have a significant impact on the sales tax base, for the simple reason that businesses will pass the carbon tax along to consumers in the form of higher prices. Consumers will of course see an offsetting reduction in their sales tax payments, so their overall cost of living won't change significantly, but replacing downstream costs (sales tax payments) with upstream costs (fuel costs) is going to significantly increase the sales tax base. (By analogy: Restaurants that do away with tipping in favor of higher wages—and higher prices—will see increases in their sales taxes and payroll taxes because tips are not included in the tax base and wages and prices are.)

This is relevant for I-732's tax swap because the net effect is likely to shift taxes upstream in a way that increases the sales tax base. The OFM fiscal estimate for FY2019 is that the carbon pollution tax will generate about $2 billion, of which we estimate from CTAM and other data sources that 50% ($1 billion) will be paid upstream by businesses that will pass costs along to consumers. Now, we also know that 1/3 of the sales tax is paid by business, so businesses will get a savings of about $500m from lower sales taxes, and those lower costs will also get passed along to consumers. (We assume that the B&O tax reductions for manufacturers do not get passed along to consumers because these are for products that are exported or otherwise priced on a national or global level.)

Overall, then, businesses will see costs increases of about $500m after the tax swap, and they will pass those costs along to customers in the form of higher prices. Those customers will get an offsetting benefit in the form of lower sales taxes, but that additional $500m will be added to the sales tax base and taxed at 6% in FY2018 and 5.5% thereafter. **Adding this sales tax revenue will change the 4-year fiscal impact by $112.3m. Adding additional B&O tax revenue (at 1.5%) will change the 4-year fiscal impact by an additional $30.0m, for a grand total of $142.3m.**

Fiscal Year	2018	2019	2020	2021
Upstream carbon tax costs	$727.5m	$986.1m	$1,044.9m	$1,094.7m
Upstream sales tax reduction	$227.8m	$501.7m	$550.8m	$576.7m
Tax base increase	$499.7m	$484.4m	$494.1m	$518.0m
Boost in sales tax revenue	$30.0m	$26.6m	$27.2m	$28.5m
Boost in B&O tax revenue	$7.5m	$7.3m	$7.4m	$7.8m

The Effects of Relative Population Growth and AB32 on I-732 Revenue

January 28, 2016

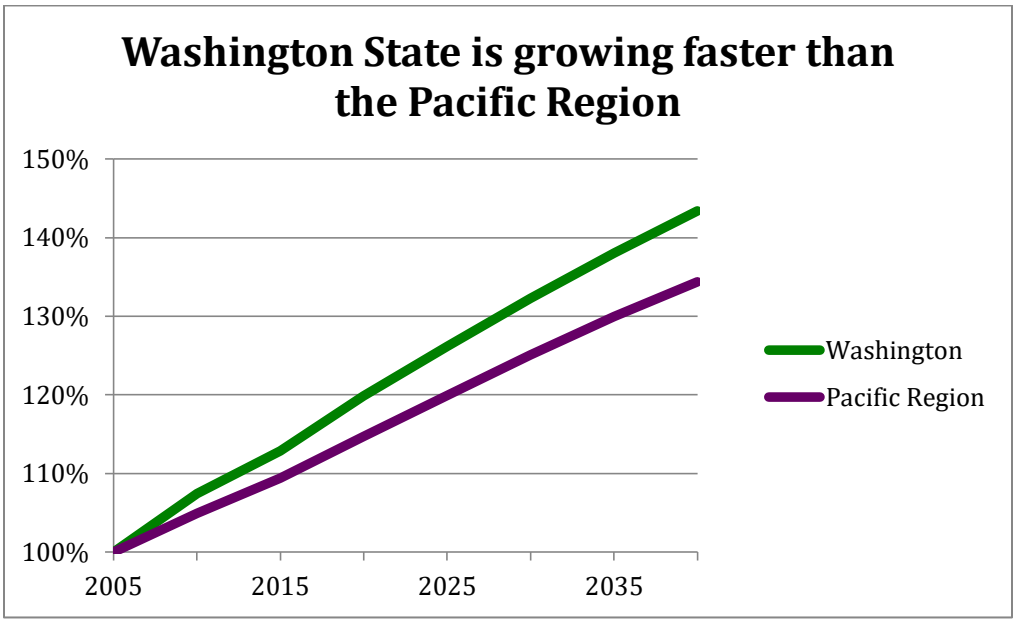
The state model (CTAM) projects future energy consumption in Washington State by modifying regional projections from the U.S. Energy Information Administration. There are no state-level EIA projections, hence the need to take the regional projections (for the Pacific Region, which includes California, Washington, Oregon, Hawaii, and Alaska) and "downscale" them to Washington State.

Source: EIA

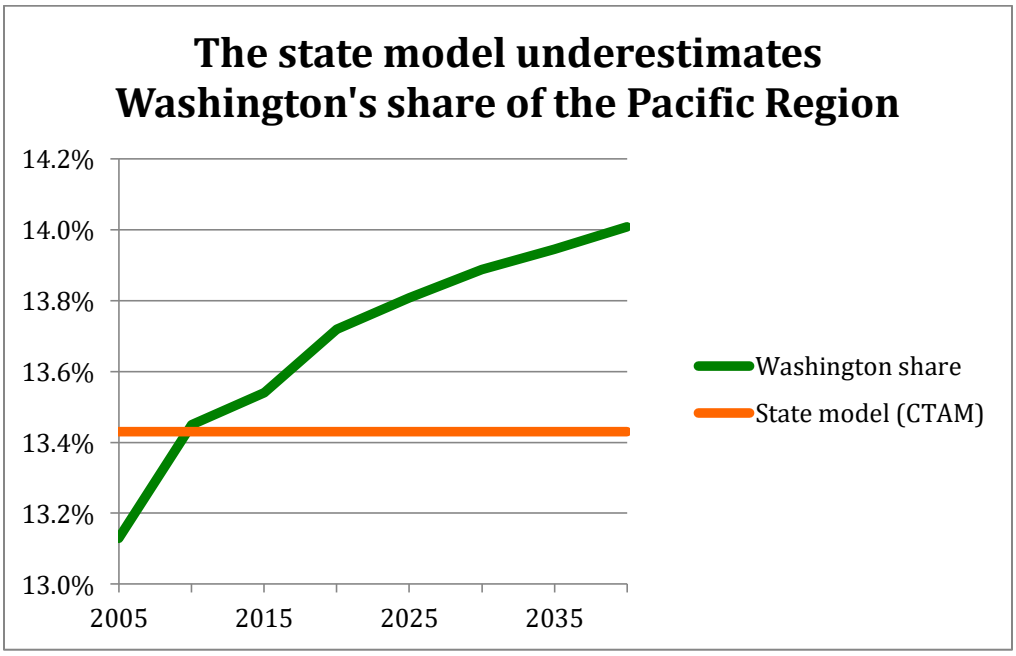
The way CTAM does this "downscaling" is by looking at historic consumption data for motor gasoline, jet fuel, etc. (this data exists for both the Pacific Region and for Washington State) and then calculating a "proration factor": take the average for 2006-2012 of consumption of (say) motor gasoline in the Pacific Region and the average for 2006-2012 of consumption of motor gasoline in Washington State and then divide one by the other to get a proration factor of 12.7% for motor gasoline. (Not surprisingly, this is pretty close to Washington State's 13.4% share of the Pacific Region population averaged over 2006-2012.) CTAM then combines this proration factor with the EIA's regional estimates: the Pacific Region is projected to

consume 18.768 billion gallons of motor gasoline in 2020, so CTAM projects that Washington State will consume 12.7% of that, i.e., 2.384 billion gallons.

So far so good, but there's a complication that CTAM doesn't address: Washington State's share of the Pacific Region is growing and is projected to continue growing. This is true for population (see first graph below) and it is certainly also true for fossil fuel consumption because of the close correlation between those variables. The second graph below shows that Washington State grows from 13.43% of the Pacific Region in 2006-2012 to 13.72% of the Pacific Region in 2020.



Source: Based on Census Bureau and state population projections



Source: Based on Census Bureau and state population projections

Now, Washington State growing from 13.43% to 13.72% of the Pacific Region may not seem like a big deal, but it actually is for Washington State for the simple reason that Washington State is relatively small compared to the Pacific Region as a whole. (To attempt to analogize: California is the big gorilla in the Pacific Region, and Washington State is like a baby gorilla riding around with the big gorilla. If the baby gorilla goes from being 13% of the weight of the family to 14% of the weight of the family that's actually a huge amount of growth for the baby gorilla because of how massive the big gorilla is.)

Source: https://backyardzoologist.wordpress.com/tag/babies/

Another way to look at it is to return to the numbers and look at them in percentage terms: By 2020 Washington State is projected to be 13.72% of the Pacific Region (by population), not the 13.43% assumed by CTAM. That's an increase of 2.15%, and if carbon emissions track that increase then OFM's $2,089.7 billion in carbon tax revenue for FY2020 becomes $2,134.6 billion, an increase of $44.9m for FY2020.

Following the same process for the other years in the 4-year budget outlook yields the following, with a **4-year revenue difference of $155.6 million**:

Fiscal Year	2018	2019	2020	2021
WA share of Pacific Region	13.65%	13.68%	13.72%	13.74%
% growth in WA share over 13.43% CTAM assumption	1.62%	1.88%	2.15%	2.28%
OFM revenue	$1,455.1m	$1,972.2m	$2,089.7m	$2,189.3m
Adjusted revenue	$1,478.6m	$2,009.3m	$2,134.6m	$2,239.3m
Revenue difference	$23.5m	$37.1m	$44.9m	$50.0m

Addendum: Not only is the baby gorilla growing, but the big gorilla is on a diet: under a California law known as AB32, emissions in 2020 are legally required to be "approximately 15 percent below emissions expected under a 'business as usual' scenario." These emissions reductions are included in the EIA projections for the Pacific Region and will drive down the Pacific Region's emissions numbers. As a result CTAM will mistakenly give Washington State credit for some of these emissions reductions.

We can fix this by estimating Pacific Region emissions *without* the "California diet". To return to business as usual, we calculate that California emissions in 2020 *without* AB32 would be 100/0.85 = 117.6% of what they are projected to be with AB32. California is approximately 75% of the Pacific Region, so without AB32 the Pacific Region's emissions in 2020 would be higher by 17.6*0.75 = 13.2%. Washington's emissions in 2020 increase by a corresponding amount, and we can combine this "California diet" issue with the population growth issue described above to get a **four-year revenue difference of $1,095.3 million**.

Fiscal Year	2018	2019	2020	2021
California diet (est.)	11%	13%	15%	15%
Pacific Region emissions without California diet	109.3%	111.2%	113.2%	113.2%
% growth in WA emissions by eliminating CA diet	9.3%	11.2%	13.2%	13.2%
% growth in WA share over 13.43% (from above)	1.62%	1.88%	2.15%	2.28%
Combined % growth for WA	11.07%	13.29%	15.63%	15.78%
OFM revenue	$1,455.1m	$1,972.2m	$2,089.7m	$2,189.3m
Adjusted revenue	$1,616.2m	$2,234.3m	$2,416.3m	$2,534.8m
Revenue difference	$161.1m	$262.1m	$326.6m	$345.5m