Information Letter Series

Proposed Changes to Product Make Allowances in the Recommended Decision and Potential Farm Milk Price Impacts

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The changes to proposed pricing formulas in the recently-released Recommended Decision on Federal Milk Marketing Orders will result in higher Class I prices, lower Class III prices and initially lower Class II and Class IV prices. The impacts on farm milk prices (e.g., the Blend Price) will vary by Federal Milk Marketing Order, with price increases for Orders with higher Class I utilization and price decreases for Orders with high Class III utilization. The dynamic effects of the proposed changes include adjustments to milk supply and product prices that are not reflected in static analyses that use historical product prices to calculate how class prices would be different. Analyses with a dynamic global dairy supply chain model suggest that the impacts of the proposed changes on class prices will vary over time.

Introduction

On July 1, 2024, the Dairy Division of the Agricultural Marketing Service of USDA released a Recommended Decision regarding proposed changes to milk pricing under Federal Milk Marketing Orders (FMMO). One key proposed change in the Recommended Decision is to increase the make allowances used in dairy product pricing formulas. Concern about make allowances was a principal motivation for the commencement of hearings in August 2023, and many major dairy organizations supported increasing the values of make allowances.

Make allowances are intended to account for the costs of transforming farm milk into the products used in FMMO pricing formulas. These formulas provide the values of components (butterfat, nonfat solids, protein and other solids) used in calculating class prices. The simplest example of the use of a make allowance is to calculate the butterfat value used in setting the minimum regulated price for all milk under FMMO. For butterfat, this formula looks like:

Butterfat Price = (Butter Price – Make Allowance for Butter) x Butter Yield Factor,

where the Butterfat Price is in $/lb butterfat, the Butter Price and Make Allowance are in $/lb of butter, and the Butter Yield factor is the lbs of butter that can be made from a lb of butterfat. In the current formulas, the Make Allowance for Butter is $0.1715/lb and the yield factor is 1.211[1]. In May 2024, the average monthly Butter Price was $3.0316/lb, so the value of butterfat in milk priced for May 2024 would be:

$$Butterfat\ Price = (3.0316 - 0.1715) \times 1.211 = \$3.4636/lb$$

This value of butterfat is used in the calculation of minimum regulated value of farm milk (with some modifications by the Class of milk).

Increases in the make allowance will reduce the values of components used for pricing farm milk, given a particular product price. For example, the Recommended Decision proposes a change in the make allowance for butter from 0.1715 to 0.2257 (this can literally be interpreted as an increase in cost of transforming farm milk into butter from 17.15¢ to 22.57¢ per pound). This change would imply a reduction of $0.0656 in the Butterfat Price using the new value of the butter make allowance (Table 1) in the formula with same butter price and yield factors:

$$Butterfat\ Price = (3.0316 - 0.2257) \times 1.211 = \$3.3979/lb$$

This reduction in the Butterfat Price would, other things being equal, result in a lower value of the minimum regulated price for all classes of milk.

The Recommended Decision proposes to increase the values of the make allowances for all four products, citing information from four estimates of manufacturing costs (Table 1). The values proposed for make allowances are larger than those proposed by some dairy organizations (e.g., National Milk Producers Federation; NMPF) but lower than the maximum values for future years proposed by other organizations (e.g., IDFA). Importantly, the Recommended Decision does not provide a mechanism for modifying make allowances in the future (other than another future hearing).

Table 1. Make Allowances for Four Dairy Products, Recommended Decision and Proposed by NMPF and IDFA, $/lb product

Product	Current Value	Recommended Decision	NMPF Proposal	IDFA Proposal[1]
Cheese	0.2003	0.2504	0.2400	0.2422-0.2840
Dry Whey	0.1991	0.2653	0.2300	0.2582-0.3172
Nonfat Dry Milk	0.1678	0.2268	0.2100	0.2198-0.2716
Butter	0.1715	0.2257	0.2100	0.2215-0.2785

[1] Values increase from Year 1 to Year 5. Make allowances are used in formulas that calculate the values of four components in farm milk: butterfat, protein, other solids, and nonfat solids. Butter prices determine the value of butterfat used with modification for all Class prices and the value of protein for Class III prices. Dry whey prices determine the value of other solids for Class III prices. NDM prices determine the value of nonfat solids used in pricing Class IV.

[1] This value is greater than 1 because 1 lb of butterfat can be used to make more than 1 lb of butter—given that butter is typically about 82% butterfat but also contains water, salt and other dairy solids.

What are the Likely Impacts of the Make Allowance Changes on Minimum Regulated Milk Prices?

As noted above, increases in the make allowance values will result in a *decrease in most component values* used for setting minimum regulated prices. However, the Recommended Decision proposes another change—to increase the assumed amount of components in farm milk—that will partly offset the decrease in component values. For example, the Class IV Skim Milk price (used in setting Class IV, Class I and Class II prices) depends on the value of nonfat solids, which is calculated based on the nonfat dry milk (NDM) price and the NDM make allowance. In the current formula, the Class IV Skim Milk Price is calculated as:

Class IV Skim Milk Price = Nonfat Solids Price x Yield

where the Yield describes the amount of nonfat solids in one cwt of skim milk. Citing evidence that the amounts of components in farm milk have increased, the Recommended Decision increased the yield from 9.0 to 9.3 lbs of nonfat solids per cwt of skim milk. The increase in the Yield factor will offset to some extent the decrease in the Nonfat Solids Price that results from the increase in make allowance for NDM. For example, at the May 2024 NDM price of $1.1422/lb, the Class IV Skim Milk Price would be

Class IV Skim Milk Price = 0.9647 x 9.0 = $8.68/cwt skim milk

under the current formulas. With the change to the make allowance and the yield factor, the Class IV Skim Milk Price for May 2024 would be:

Class IV Skim Milk Price = 0.9062 x 9.3 = $8.43/cwt skim milk

That is, the change in the make allowance lowered the value of the nonfat solids, but the increase in the Yield factor offsets to some extent the effect of the decrease in the nonfat solids value on Class IV prices[2]. The Recommended Decision proposes increases in protein and other solids content of milk that would have a similar (partially offsetting) effect on Class III Prices.

Short-Term Static Impacts

To illustrate the types of changes in milk values implied by the modification proposed in the Recommended Decision, it is useful to consider an example for one month (Table 2). If the proposed changes in make allowances and yield factors were implemented in May 2024, they would have resulted in decreases in the Class II price (-$0.74/cwt), the Class III price (-$0.59/cwt) and the Class IV price (-$0.47/cwt). [Class I values would have increased due to proposed changes in the Class I differentials and return to the "higher of" Class III and Class IV Skim Milk in pricing rather than the average of these two values plus $0.74/cwt. More information on the impacts of proposed changes in Class I Differentials is in Information Letter 24-04.]

[2] Without the increase in Yield from 9.0 to 9.3, the Class IV Skim Price value would be $8.16/cwt skim milk.

Table 2. Summary of Changes in Class Prices for May 2024 with the Recommended Decision Compared to Current

Class Price	Current	Recommended Decision	Difference
Class IV			
Class IV Butterfat Price	3.4636	3.3979	-0.0656
Class IV Nonfat Solids Price	0.9647	0.9062	-0.0584
Yield (Nonfat Solids per cwt skim)	9.0	9.3	0.3
Class IV Skim Price	8.68	8.43	-0.25
Class IV Price	20.50	20.03	-0.47
Class III			
Class III Other Solids Price	0.2181	0.1499	-0.0682
Class III Protein Price	1.7352	1.6353	-0.0998
Class III Butterfat Price	3.4636	3.3979	-0.0656
Class III Skim Price	6.67	6.30	-0.37
Percent Protein	3.1	3.3	0.2
Percent Other Solids	5.9	6.0	0.1
Class III Price	18.55	17.97	-0.59
Class II			
Advanced Class IV Skim Milk Pricing Factor	8.9902	8.4645	-0.5257
Class II Differential	0.70	0.70	0.00
Class II Skim Milk Price	9.69	9.16	-0.53
Butterfat Price	3.4636	3.3979	-0.0656
Butterfat Differential	0.007	0.007	0.000
Class II Butterfat Price	3.4706	3.4049	-0.0656
Class II Milk Price	21.50	20.76	-0.74
Class I			
Advanced Class III Skim Milk Pricing Factor	3.8763	3.1487	-0.7276
Advanced Class IV Skim Milk Pricing Factor	8.9902	8.4645	-0.5257
Average of Advanced Class III and IV Skim Milk Pricing Factor	6.4332	--	--
Differential	0.74	0.00	-0.74
Higher of Advanced Class III and Class IV Skim Milk Pricing Factor	--	8.4645	--
Base Class I Skim Milk Price	7.17	8.46	1.29
Advanced Butterfat Pricing Factor	3.2954	3.2297	-0.0656
Base Class I Price	18.46	19.47	1.02
Class I Differential	2.63	3.87	1.24
Class I Price	21.09	23.34	2.26

It is important to note that the *difference in component prices* for butterfat, other solids, and nonfat solids between the values in the Recommended Decision and the current formulas is the same even as butter prices, whey prices, and NDM prices vary. For example, the impact of the proposed changes on the butterfat value is always -$0.0656/lb butterfat, regardless of the butter price used to calculate the butterfat value. (The actual butterfat value used in the pricing formulas changes with butter price, but the impact of the proposed change relative to current formulas does not.) The impact of the proposed changes on the component value for protein does vary as the prices of butter and cheese change, because the protein price depends on both the butter and cheese prices. For example, the value of the protein component with the proposed changes would be $0.0998/lb protein lower with the proposed changes in May 2024 but would have varied from $0.0896/lb to $0.1054/lb lower from January 2023 to May 2024 due to changes in cheese and butter prices.

Differences in Impacts of the Recommended Decision Based on Utilization

Although the Class II, Class III and Class IV prices are expected to be lower in the short-term with the changes proposed in the Recommended Decision, the expected short-term impacts on the Class I price will be positive. Thus, differences in utilization among FMMOs will affect the net impact on the average farm milk price.

Consider the comparison of the value of key elements of the FMMO pool between Federal Order 30 (Upper Midwest) and Federal Order 6 (Florida). These orders have very different milk utilization, with predominantly Class III utilization of milk in the Upper Midwest and predominantly Class I utilization in Florida. In both markets, the short-term impact of the Recommended Decision is to lower the value of milk in Classes II, III, and IV and to raise the value of milk used in Class I (Table 3). The higher utilization of Class I in Order 6 implies that the overall value of the pool is increased by the changes, about $1.80/cwt. In contrast, the higher Class III utilization in Order 30 implies a decrease in the value of the milk pool by about $0.80/cwt.

In its Regulatory Economic Impact Analysis[3], USDA highlighted differences in the impacts of the Recommended Decision by Order, with negative impacts identified for Order 30, Order 51 (California) and Order 131 (Arizona). The analysis was based on a review of the impacts from January 2019 to December 2023. Their historical assessment reported a smaller impact for Order 30 (-$0.10/cwt[4] rather than -$0.81/cwt) than we estimated for May 2024. This implies that the impacts of the Recommended Decision will vary over time, perhaps considerably, highlighting the importance of considering impacts over a longer time horizon.

[3] https://www.ams.usda.gov/sites/default/files/media/DairyFMMO_ImpactAnalysisPricingRecDec.pdf

[4] Based on the Statistical Uniform Price (Blend Price) at actual farm milk component test.

Table 3. Summary of Changes in Pooled Value of Milk in May 2024 with the Recommended Decision Compared to Current, Order 30 (Upper Midwest) and Order 6 (Florida)

Order, Category of Milk	Current			Recommended Decision			Difference	
Order 30 (Upper Midwest) May 2024	Pounds	Unit Value	Dollar Value	Pounds	Unit Value	Dollar Value	in Unit Value	in Dollar Value
Class I Skim	157,863,761	7.1800	11,334,618	157,863,761	8.4645	13,362,378	1.2845	2,027,760
Class I Butterfat	3,061,177	3.2954	10,087,803	3,061,177	3.2297	9,886,797	-0.0657	-201,006
Class I Differential Value	160,924,938	1.71	2,756,996	160,924,938	2.91	4,688,095	1.2000	1,931,099
Class II Nonfat Solids	2,110,104	1.0767	2,271,949	2,110,104	1.0183	2,148,672	-0.0584	-123,277
Class II Butterfat	5,053,240	3.4706	17,537,775	5,053,240	3.4049	17,206,004	-0.0657	-331,771
Class III Protein	82,706,829	1.7349	143,488,078	82,706,829	1.6353	135,253,293	-0.0996	-8,234,785
Class III OS	148,068,044	0.2181	32,293,640	148,068,044	0.1499	22,190,217	-0.0682	-10,103,423
Class III Butterfat	100,194,910	3.4636	347,035,090	100,194,910	3.3979	340,456,783	-0.0657	-6,578,307
Class IV Nonfat Solids	1,088,106	0.9647	1,049,696	1,088,106	0.9062	986,092	-0.0585	-63,604
Class IV Butterfat	7,701,327	3.4636	26,674,316	7,701,327	3.3979	26,168,685	-0.0657	-505,631
								0
SCC Adjustment			4,423,992			4,423,992		0
								0
Producer Milk Value			598,953,952			576,771,008		-22,182,945
Producer Milk, lbs	2,754,563,177			2,754,563,177				
Producer Milk, $/cwt		21.74			20.94		-0.81	

Order, Category of Milk	Current			Recommended Decision			Difference	
Order 6 (Florida) May 2024	Pounds	Unit Value	Dollar Value	Pounds	Unit Value	Dollar Value	in Unit Value	in Dollar Value
Class I Skim Milk	165,150,935	7.1800	11,857,837	165,150,935	8.4645	13,979,201	1.2845	2,121,364
Class I Butterfat	3,977,351	3.2954	13,106,962	3,977,351	3.2297	12,845,798	-0.0657	-261,165
Class I Differential at Location	169,128,286	5.54	9,370,475	169,128,286	6.9405	11,738,271	1.4000	2,367,796
Class II Skim Milk	28,803,781	9.6900	2,791,086	28,803,781	9.1645	2,639,723	-0.5255	-151,364
Class I Butterfat	3,737,622	3.4706	12,971,791	3,737,622	3.4049	12,726,397	-0.0657	-245,394
								0
Class III Skim Milk	4,411,025	6.6600	293,774	4,411,025	6.2958	277,709	-0.3642	-16,065
Class III Butterfat	180,125	3.4636	623,881	180,125	3.3979	612,055	-0.0657	-11,826
Class IV Skim Milk	1,782,190	8.6800	154,694	1,782,190	8.4281	150,205	-0.2519	-4,490
Class IV Butterfat	149,883	3.4636	519,135	149,883	3.3979	509,294	-0.0657	-9,841
Producer Milk Value			51,689,636			55,478,652		3,789,016
Producer Milk, lbs	208,192,912			208,192,912				
Producer Milk, $/cwt		24.83			26.65		1.82	

Note: For simplicity, the producer milk values above do not include adjustments for overages, inventory, location, transportation credits, assembly credits or producer settlement funds, so do not correspond directly to changes in reported Statistical Uniform (Blend) Prices. In general, these adjustments would result in only small modifications to milk values and would not affect the relative comparison based on different utilization.

Dynamic Assessment of the Changes Proposed in the Recommended Decision

A common approach to evaluating the impacts of changes to FMMOs is to use historical data on the product prices and modify make allowances and yield factors to calculate a new series of class prices. Another approach uses observed historical quantities (lbs) of milk and components pooled by Order and then adjusts the monetary value of those quantities to reflect changes to the value of components based on modified pricing formulas. This latter is the approach adopted by USDA and for our comparison of how impacts differ by Order (Table 3).

Although frequently used, these approaches have the limitation that they do not account for how changes in the farm milk price due to changes in the formulas will affect milk production, its allocation to different uses and product prices. In essence, both static historical approaches assume that total milk production, allocation and product prices will be unchanged even as farm milk prices are changed. Thus, although helpful as a first approximation, historical static analyses can be complemented by a forward-looking, dynamic analysis that accounts for the potential effects of farm milk prices on milk production and allocation, and thus also product prices that are used in the pricing formulas.

We used a dynamic systems model of the global dairy supply chain (Nicholson and Stephenson, 2015) to evaluate the dynamic impacts of the changes proposed in the Recommended Decision. This model incorporates dynamic decision-making by farms (for 10 size categories in the US), processors, product buyers, and exporters in 15 global dairy regions. This model has previously been used to evaluate the effects of the Dairy Margin Coverage Program and proposed supply management programs (Nicholson and Stephenson, 2021). The model incorporates all elements of the classified pricing system of the US under FMMOs, albeit in aggregated geographical regions (California and the rest of the US[5]).

The impacts of proposed changes in the Recommended Decision were simulated monthly, assuming their implementation in January 2024[6] and through December 2028. Component values were decreased to account for increases in make allowances, with additional modifications to the yield factors, the butterfat retention factor used in Class III pricing, increases in national average Class I differentials, and the use of the "higher of" Class III Skim Milk Price and the Class IV Skim Milk Price, rather than their average plus $0.74/cwt.

Our analysis indicates that the impacts of the Recommended Decision will vary over time as farm milk production and dairy product markets respond to the changes in incentives resulting from proposed pricing changes (Figure 1). These results suggest negative impacts on the US All Milk price during the next three years, with positive impacts for the

[5] This geographical aggregation means it is not possible to report simulation results for each Order separately.
[6] This is prior to any likely actual implementation date but provides a five-year future time horizon to mirror the past five years analyzed by USDA.

subsequent two years. Similar to the results of the static historical analyses, our results project increases in Class I prices and decreases in Class III prices from 2024 to 2028, albeit with variation year by year. Negative impacts are projected for Class II and Class IV prices during the first three years, with subsequent increases in the final two years of the simulation. For the entire five-year projection period, the average All Milk, and Class III prices are lower than with current pricing formulas and the average Class I, Class II and Class IV prices are higher. Although not shown, the model projects modest increases in average over-order premiums, about $0.04/cwt as a result of changes proposed in the Recommended Decision.

These results reflect the impacts of complex interaction among farm production, processing, demand, and exports resulting from proposed changes to the price formulas. Why does the average Class I price not increase by the amount of the national average increase in the Class I differential, $1.24/cwt? The Class I Price depends on the values of Class III and Class IV Skim Milk Prices, and both of these prices initially decrease as a result of the proposed changes (despite the use of the "higher of" these two prices in calculating the Class I price). As a result, the average Base Class I Skim Price is projected to decrease by about $0.70/cwt, so the net impact on the Class I prices is about $0.70/cwt (Figure 1). Why do Class II and IV prices not consistently decrease? This is the result of a dynamic milk supply response. The projected initial decreases in the All Milk Price result, over time, result in decreases in US milk production. As projected dairy product demand grows over time, this modifies the supply and demand balance for butterfat, with increasing butterfat prices projected later in the simulated time period. These project higher butterfat prices affect all Class prices and result in a higher All Milk Price in Year 4 (2027) and Year 5 (2028).

Key Points:

- The proposed changes to pricing formulas (make allowances, yield factors, composition, retention factors, and Class I differentials) proposed in the Recommended Decision would have the effect of increasing Class I prices, decreasing Class III prices, and initially decreasing Class II and IV Prices;
- The impacts of these changes on prices paid for farm milk will be positive for markets with considerable Class I utilization and negative for markets with considerable Class III utilization;
- Although helpful as a first approximation, historical static analyses can be complemented by analyses that account for the effects of farm milk prices on milk production and allocation, and thus also product prices that are used in the pricing formulas;
- Analyses with a dynamic dairy supply chain model indicate that Class I price increases will be less than the amount of the proposed change to the average national Class I differential and that the long-term impacts on Class II and IV prices will differ from the initial impacts.

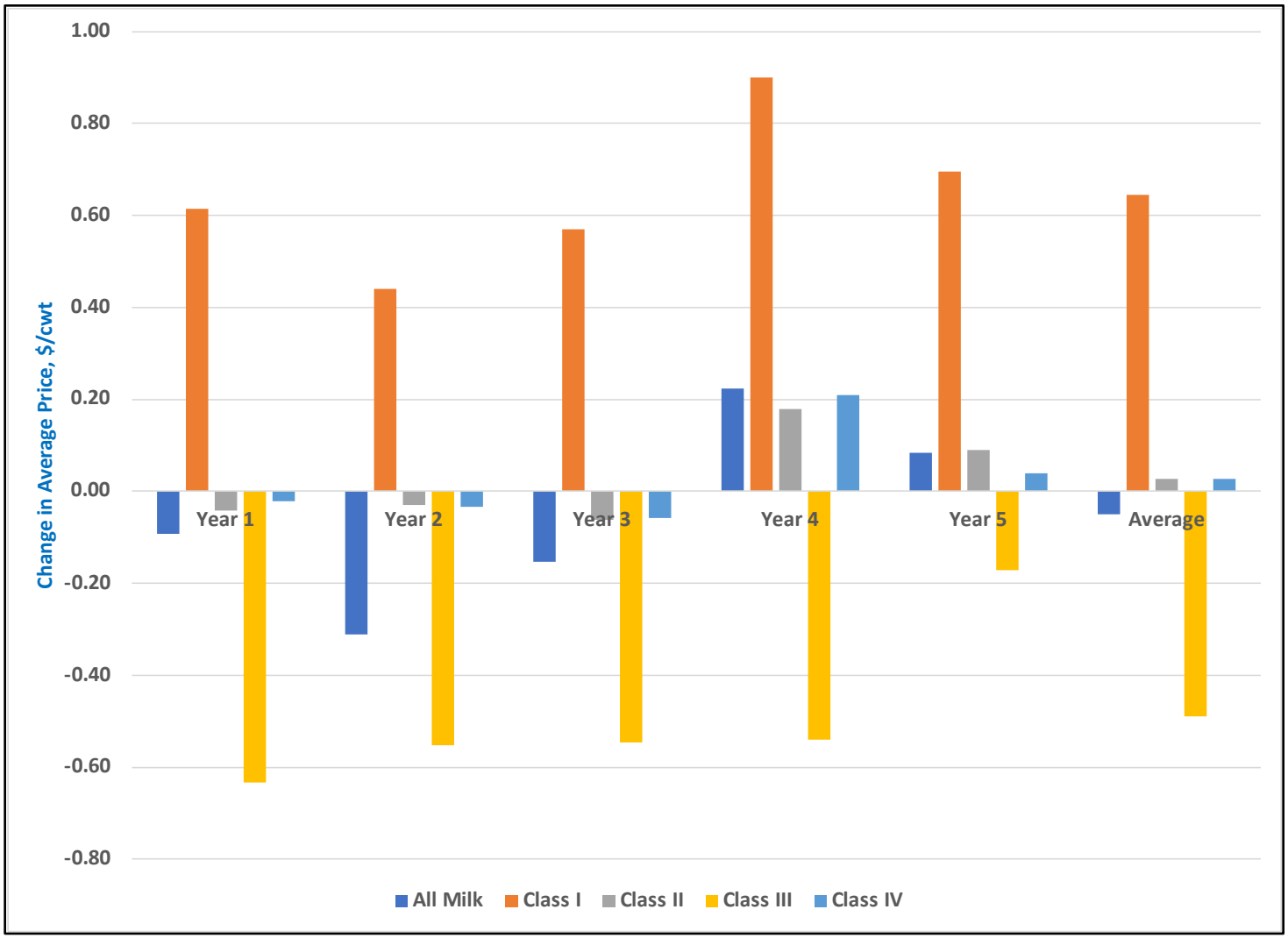

Figure 1. Simulated Differences in Class Prices and the US All Milk Price, Recommended Decision Compared to Current, 2024 (Year 1) to 2028 (Year 5) and Average Change

Note: Assumes Implementation of Recommended Decision changes in 2024.

References

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