

POLYSYS DOCUMENTATION

INFLATING

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All costs and prices are in nominal terms in the USDA baseline, so polysys also used nominal costs and prices. It is necessary to inflate our biomass costs of production from the current estimated year into all future years in POLYSYS. Also, when we simulate an exogenous offered price to biomass crops, we must inflate that price in future years.

We project the baseline costs of production beyond the end year of the baseline at the average rate of the last three years of the USDA baseline

- 1) USDA crop cost inflation is a result of a mix of input price changes and general inflation over time (see below from their documentation)
 - Total farm production expenses are projected to decline modestly to \$360 billion in 2019 due to lower expenditures on feed/livestock purchased, and oilseed purchased. Overall, nominal farm production expenses are projected to increase after 2019 and through the remainder of the projection period as crude oil prices, interest rates, and inflation all are expected to rise.

Source: USDA Baseline 2019 documentation

- 2) We cannot replicate all these individual changes in our biomass budgets, so we just assume the USDA corn costs of production inflation rate. We inflate biomass costs of production at the same rate as USDA corn costs of production inflate.
- 3) We assume the same inflation in biomass prices as we assume for baseline estimated COSTS. This keeps the relative profitability and competitiveness of biomass the same over time....ie prices are inflated at the same rate as costs.

The table below is a comparison of the rate of inflation of all crop costs of production in USDA baseline (2019). Below is the PPICRM rate of increase. ORNL used PPICRM to inflate biomass prices in the 2016 biomass update, but using it would inflate prices faster than costs and lead to biomass becoming more economically favorable over time. Inflating prices at the same rate as costs will keep the rate of economic return more steady over time.

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030						
Corn	1	1.01	1.02	1.03	1.04	1.05	1.07	1.08	1.09	1.10	1.11	1.12	1.13	Rate we inflate biomass costs at!!					
Sorghum	1	0.94	0.96	0.97	0.98	0.99	1.01	1.02	1.04	1.04	1.06	1.07	1.08	And the rate we now					
Oats	1	1.18	1.20	1.22	1.23	1.25	1.28	1.30	1.31	1.33	1.34	1.36	1.38	inflate biomass prices at!!					
Barley	1	1.01	1.03	1.05	1.06	1.07	1.09	1.11	1.12	1.14	1.15	1.16	1.18						
Wheat	1	0.94	0.96	0.97	0.98	0.99	1.01	1.03	1.04	1.05	1.06	1.08	1.09						
soy	1	0.93	0.94	0.95	0.96	0.97	0.99	1.00	1.01	1.02	1.03	1.04	1.05						
Cotton	1	0.85	0.87	0.88	0.89	0.90	0.91	0.92	0.94	0.95	0.96	0.97	0.98						
Rice	1	1.00	1.02	1.03	1.05	1.06	1.07	1.08	1.10	1.11	1.12	1.13	1.14						
Average		0.98	1.00	1.01	1.02	1.03	1.05	1.07	1.08	1.09	1.10	1.12	1.13						
PPICRM		1.01	1.03	1.05	1.07	1.09	1.11	1.13	1.15	1.17	1.19	1.22	1.24	Rate you used to inflate prices at!!					

CHANGES MADE ON 5/15/2019

I have automated the inflation of biomass price to equal the assumed rate we inflate costs. So to do an exogenous biomass run at \$100, then just enter \$100 in all years. The model will inflate when running the simulation.

Chad made programming changes in the WHATIF for so that prices are automatically inflated at the rate discussed above.

Before this was done externally to polysys and entered in whatifs as steadily increasing price of biomass.

NOW JUST ENTER THE PRICE YOU WANT TO SIMULATE IN CURRENT PRICE AND THE MODEL WILL AUTOMATICALLY INFLATE to REAL DOLLARS IN FUTURE YEARS.

INFLATION INDEX

The assumed inflation index is printed out in the national output under the CRP output

0	, 2018-2035																		
Item	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	
CRP ACREAGE																			
CRP NOT EXPIRED	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP RE-ENROLLED	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO CORN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO SORG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO OATS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO BARLEY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO WHEAT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO SOY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO COTT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO RICE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO SWITCHGRASS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO POPLARS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO WILLOWS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO HAY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP TO PASTURE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CRP BIOMASS HARV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
INFLATION INDEX	1.00	1.01	1.02	1.03	1.04	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.18	1.19	