$$
\begin{aligned}
\mathrm{H_2O}: &\quad \dot{n}_{\mathrm{H_2O}_{feed}} = \dot{n}_{\mathrm{H_2O}_{electrolyzer}} + \dot{n}_{\mathrm{H_2O}_{process,1}} + \dot{n}_{\mathrm{H_2O}_{process,2}} - \dot{n}_{\mathrm{H_2O}_{biproduct}} \\
\mathrm{CO_2}: &\quad \dot{n}_{\mathrm{CO_2},feed} = \dot{n}_{\mathrm{CO_2},total} - \dot{n}_{\mathrm{CO_2},biproduct} \\
\mathrm{CO}: &\quad \dot{n}_{\mathrm{CO},feed} = \dot{n}_{\mathrm{CO}_{total}} - \dot{n}_{\mathrm{CO}_{biproduct}} \\
\mathrm{CH_4}: &\quad \dot{n}_{\mathrm{CH_4},feed} = \dot{n}_{\mathrm{CH_4}bio} + \dot{n}_{\mathrm{CH_4}fossil} \\
3\mathrm{H_2}: &\quad \dot{n}_{3\mathrm{H_2},feed} = \dot{n}_{3\mathrm{H_2},total} - \dot{n}_{\mathrm{H_2},electrolyzer} - \dot{n}_{\mathrm{H_2},biproduct}
\end{aligned}
$$