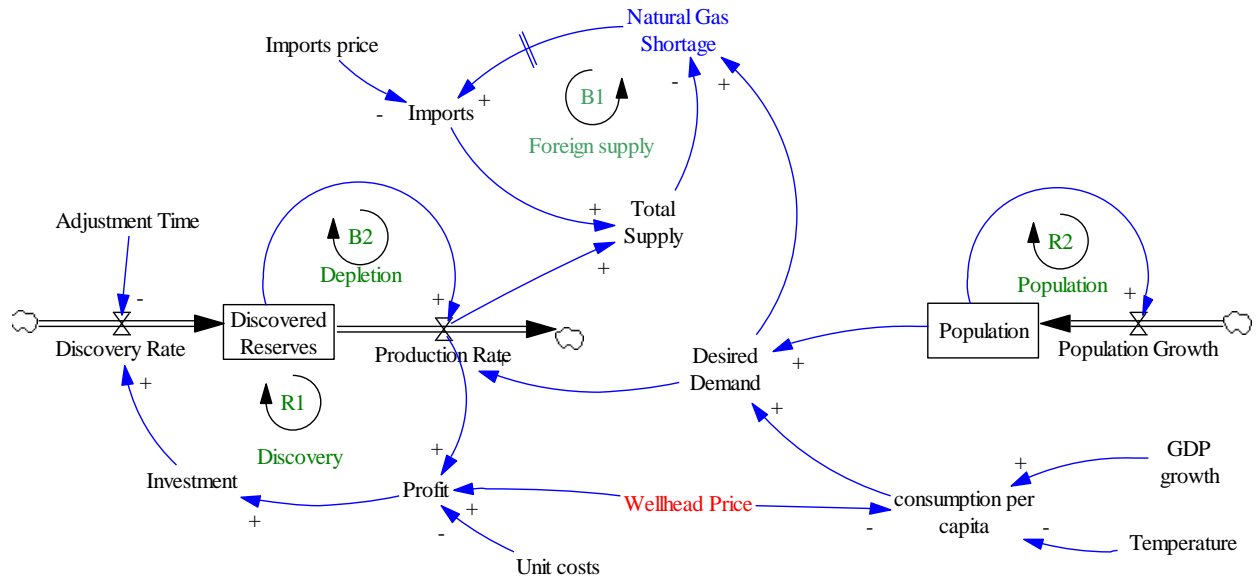


## The Gas Industry Dynamics in Argentina (GIDA) Model

### Simple Causal-Loop Diagram



**Figure 1: Explanatory causal loop diagram of natural gas shortages in Argentina**

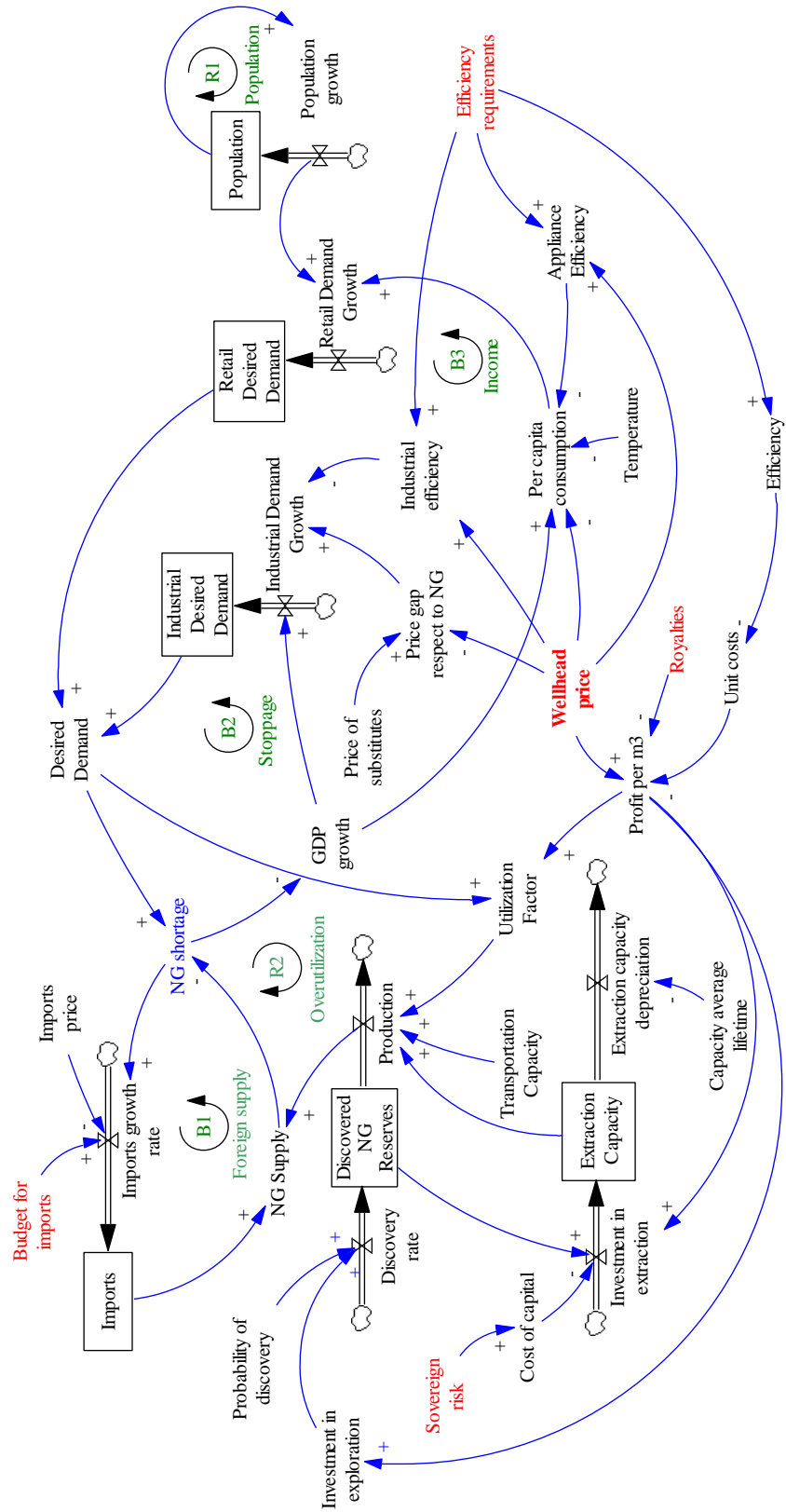


Figure 2: Complete Stocks-and-Flow and Feedback Structures

## Main loops

The GIDA Model is characterized by 4 (four) main loops:

Reinforcing loops:

- **Population loop (R1):** The loop represents the accumulation of the population stock (Figure 3).

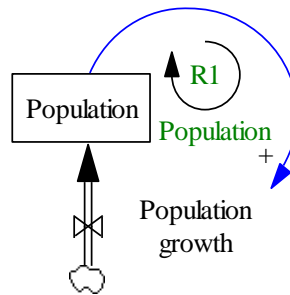


Figure 3: Population loop

- **Overutilization loop (R2):** This loop demonstrates how the increased utilization of production capacities would increase the production rate, leading to more gas supply reducing the gas shortage. The reduction of the shortage would increase the GDP (economic activity would as a result of more industrial operating hours due the reduced cuts in gas that is vital for the production). Consequently, more consumption per capita would increase leading to the increase in gas demand through increasing retail gas demand. The more gas demand the more utilization of the gas production facilities.

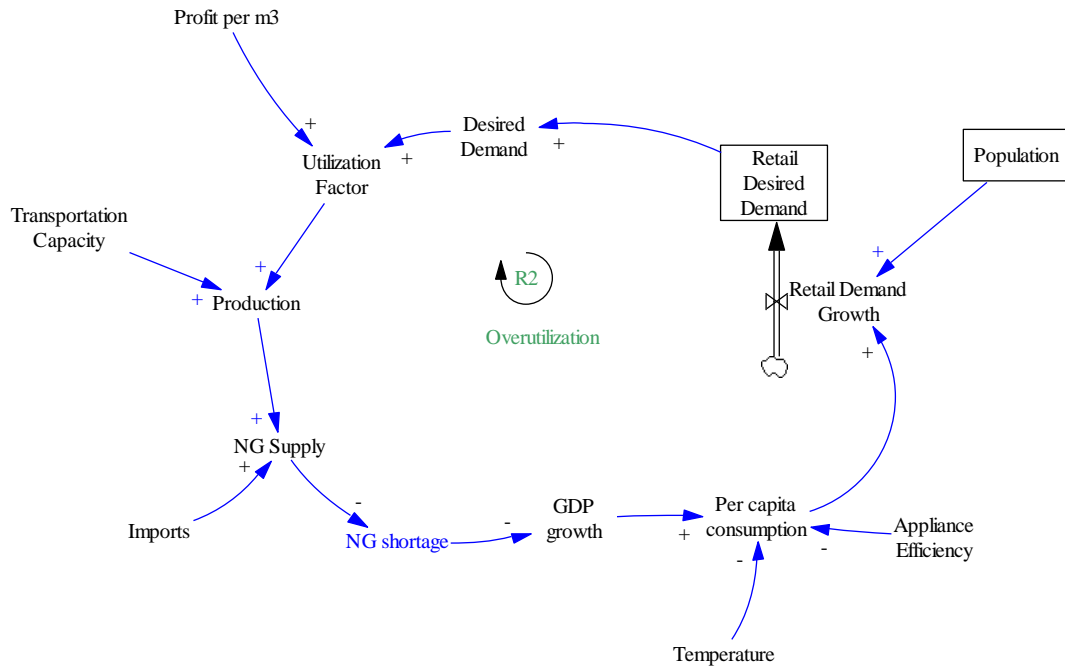


Figure 4: Overutilization loop

- **Foreign Supply loop (B1):** Models the imports stock, which in it turns increased by the imports growth rate, the import growth rate is driven by the increase in shortage (which is currently addressed by increasing the imports) and restricted by the imports price and the respective budget the government has for the respective year. The more imports and more natural gas supply.

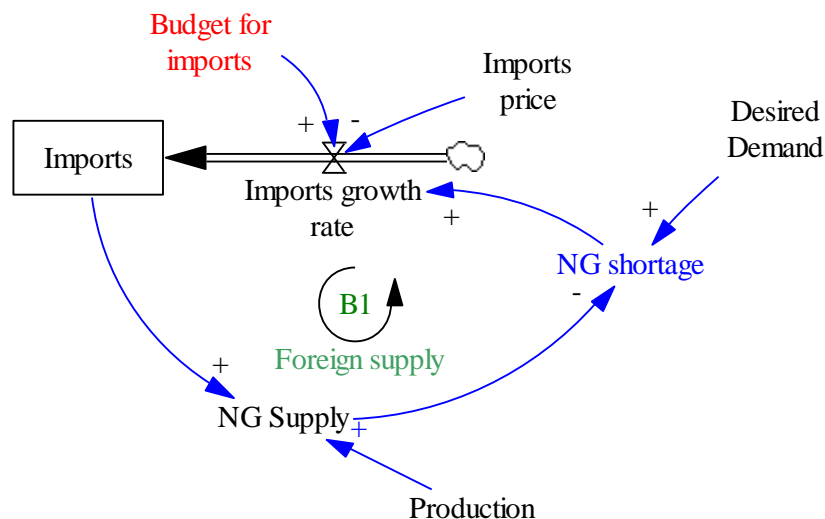


Figure 5: Foreign supply loop

- **Stoppage loop (B2) and Income loop (B3):** These two loops demonstrate how the GDP growth drives the growth in the retail desired demand (through increasing the consumption per capita) and industrial desired demand and thus increasing the natural gas shortage.

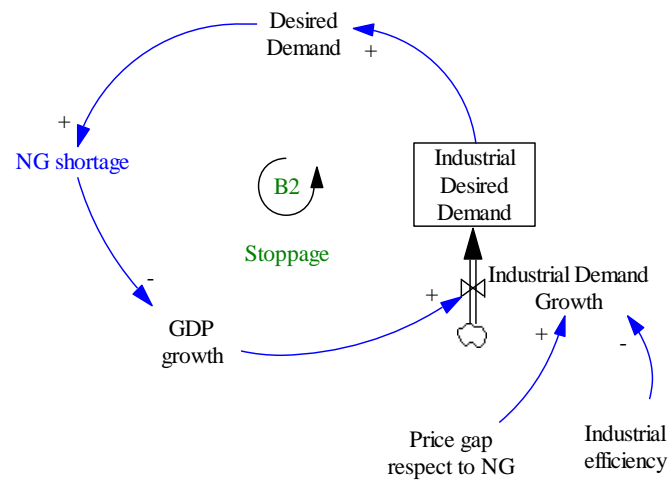


Figure 6: Stoppage loop

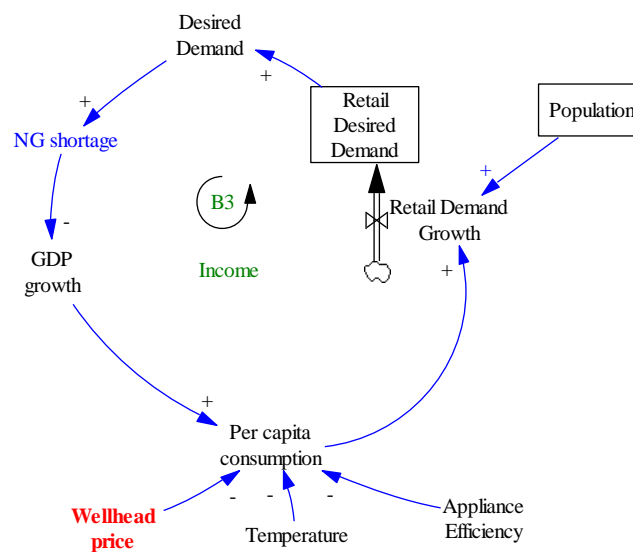


Figure 7: Income loop