# Build consensus on regional nuclear reactor specifications to determine projected enrichment demand and spent fuel quantities through systems dynamics.

Systems Dynamics

- Dynamic simulation is used to gain insight into the behavior of complex, dynamic systems

- Dynamic systems consists of the relationships between the flows (the transfers of entities between system components), levels (the accumulations of entities within the system), and the mathematical definition of how variables change dynamically

- Within a nuclear fuel cycle model, the flows will represent the costs and volumes in the cycle and simulate the response of the cycle to various scenarios

Powersim Studio

- A dynamic simulation-modeling software package that measures the flows and levels of systems dynamics

LEVEL RATE

LEVEL

HISTORICAL RATE

USER SET RATE

LEVEL
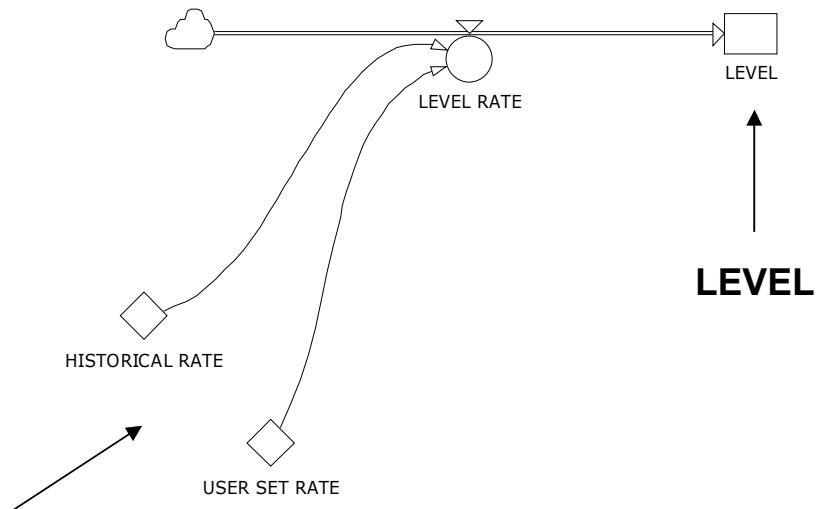
VARIABLES EFFECTING FLOW

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Nuclear Fuel Cycle

| FRONT END | ELECTRICITY | BACK END |

URANIUM MINING & MILLING

CONVERSION

REACTOR OPERATION

WASTE

ENRICHMENT

FABRICATION

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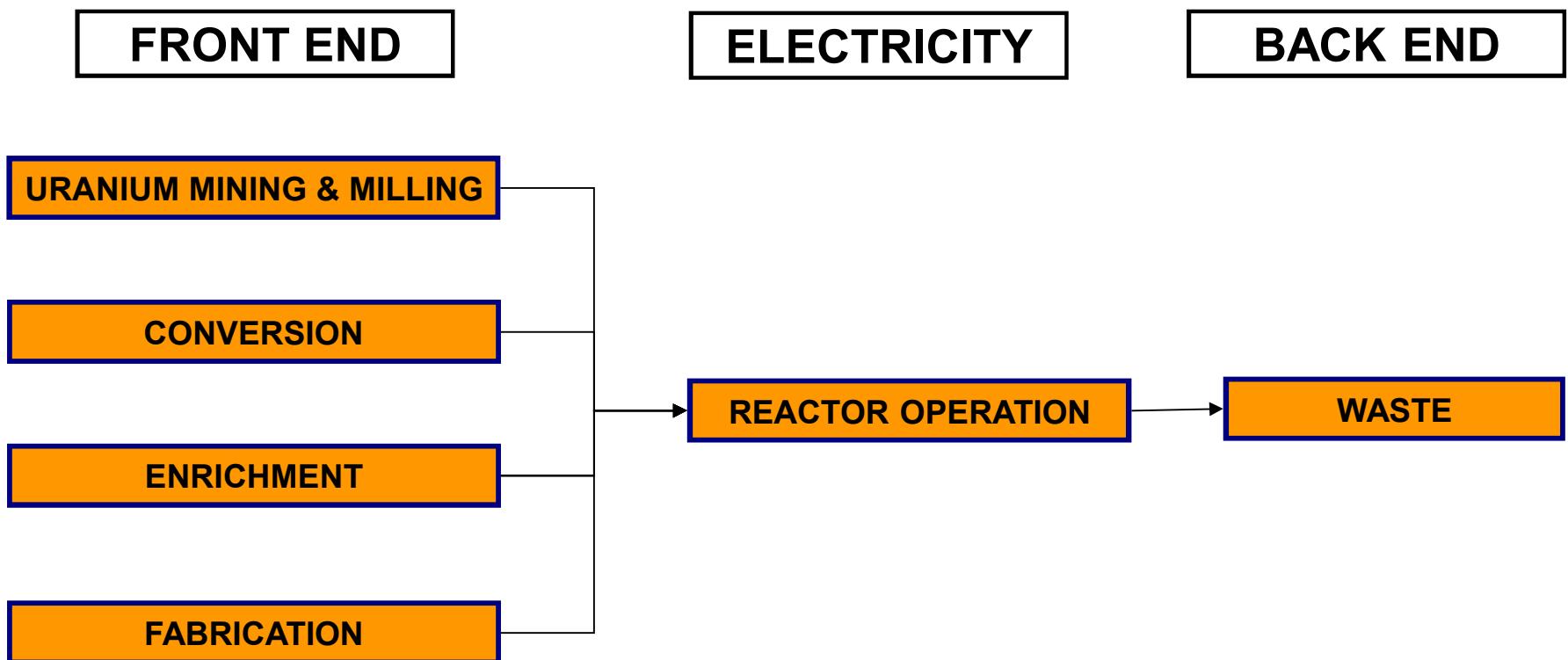
Enrichment Demand

Input Variables

- Uranium Price
- Tails Assay
- Conversion Cost
- Fractional Losses
- Enrichment Cost
- SWU Needed
- SWU Cost
- U Concentrations
- Fuel Fabrication Cost
- Burn-up Rates
- Reactor Specifications
- Electricity Generation

ENRICHMENT DEMAND

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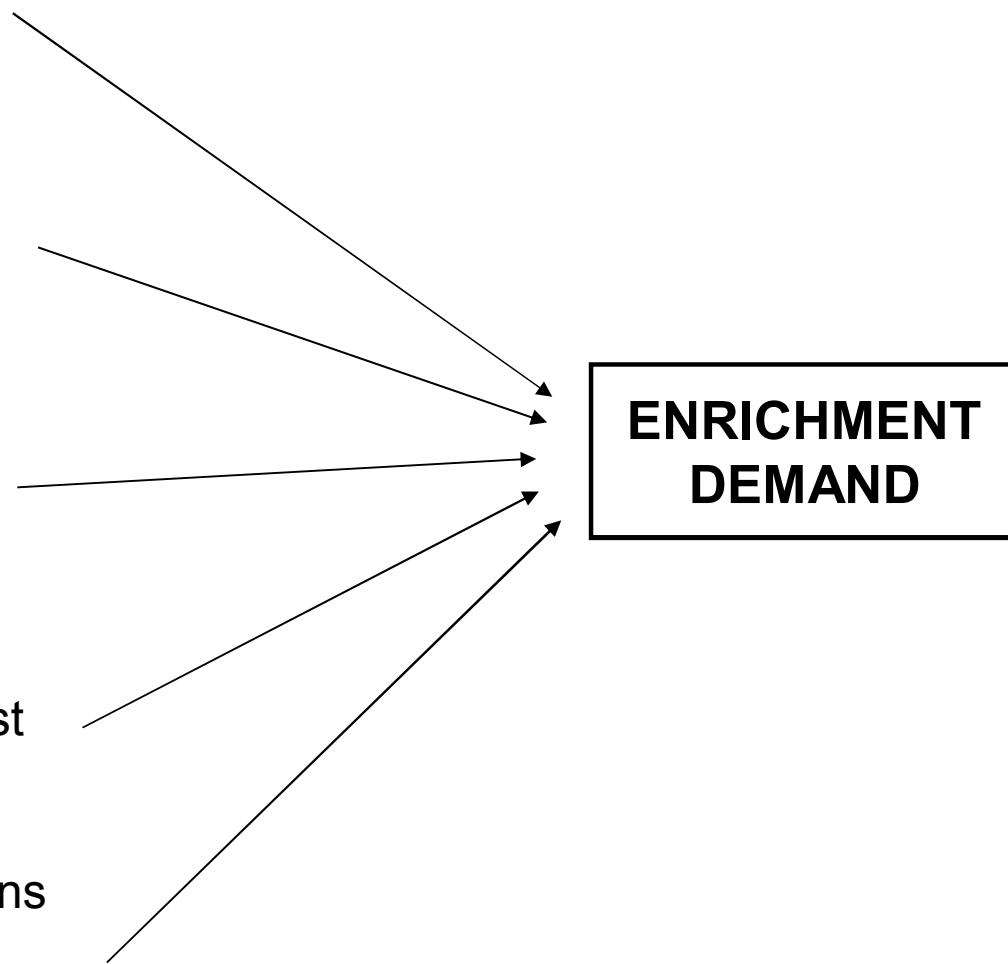
Spent Fuel

Input Variables

- Uranium Price
- Tails Assay
- Uranium Needed
- Fractional Losses
- SWU Needed
- SWU Cost
- U Concentrations
- Burn-up Rates
- Reactor Specifications
- Electricity Demand
- LEU Demand

SPENT FUEL