The "cloud" symbol represents a source or sink for various flows. A cloud effectively delimits the system boundary. After a flow enters a cloud it no longer affects the system. Similarly, what happens to a flow before it enters the system from a cloud is of no importance to the system.

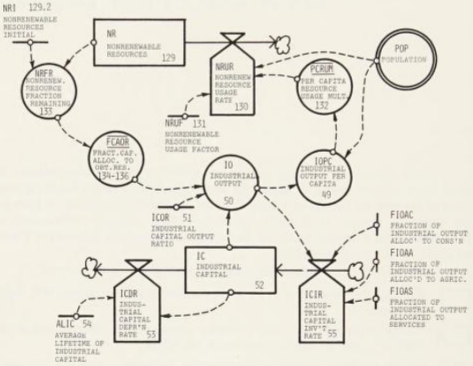

Figure C-1 Example of a DYNAMO flow diagram (nonrenewable resource sector)

Appendix D: How to Read DYNAMO Equations

A DYNAMO equation is written in the following form:

type *variable name = expression*

Type: a single letter designating the type of variable being defined:

- L indicates a level equation
- R indicates a rate equation
- A indicates an auxiliary equation
- N indicates an initial value
- C indicates a constant
- T indicates a table
- S indicates a supplementary equation

Variable name: the specified abbreviation for the variable being defined by the equation. The name must be followed by the appropriate time subscript, depending on the type of variable it is. Levels and auxiliaries have the subscript .K; rates have the subscript .KL. Initial values, constants, and tables do not have time subscripts.

Expression: any algebraic expression. It may range from a simple number or single variable to a complicated combination of factors and terms involving functions, variables, and numerical values. The operations of addition, subtraction, multiplication, and division are indicated, respectively, by +, −, *, /. Multiplication and division are carried out before addition and subtraction. Expressions enclosed in parentheses are evaluated first, and the value is substituted for the parenthetical expression.

Level Equation

A level equation defines the present value of a level variable in terms of its value from the previous evaluation and its change in value in the intervening time, DT. A level equation represents a simple numerical integration. Numerical instabilities are avoided by taking DT to be a small fraction of the shortest time delay in the model.