

THE RESOURCE SUPPLY SYSTEM: COMPONENTS, STRUCTURE, DYNAMICS

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HOW DO WE GET OUR RESOURCES?

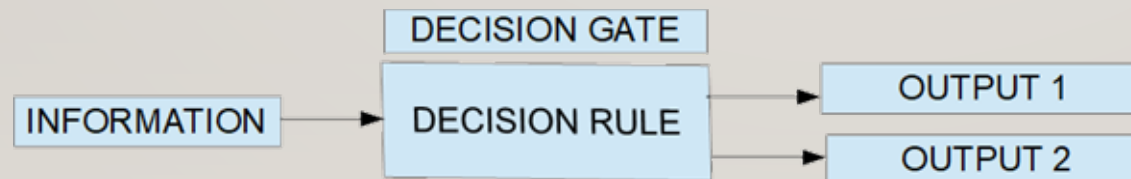
- We tend to think about resource supply coming from individual recovery projects,
- BUT we get them from a RESOURCE SUPPLY **SYSTEM** (RSS) with many:
 - Individual projects
 - Components (e.g., Physical, Financial, Economic, Background, etc.)
- That sets up contingencies, which **must** be satisfied before we can get a final product.

3 COMPONENTS OF AN RSS

- DEMAND
- FINANCING
- SOURCE
- ENTITLEMENT
- PHYSICAL SYSTEM
 - Production
 - Transport
 - Processing
- BACKGROUND
 - Legal and Regulatory
 - Environmental
 - Social
 - Political
- CONCEPTS
 - Information
 - Uncertainty, Risk, Cut-offs
 - Decision Rules
 - Valuation (e.g., NPV)
- SUPPLY

4 AGENT, CONTINGENCY, DECISION RULE

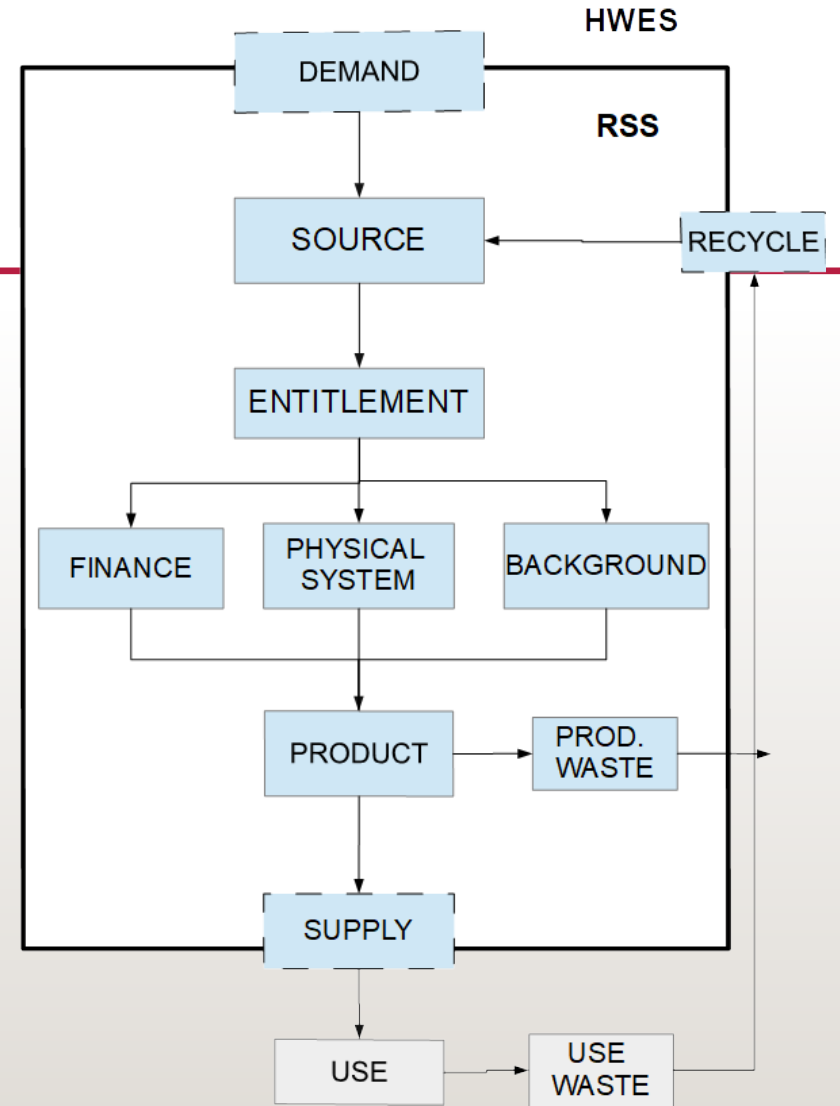
- AGENT carries out the activities (Finance, Processing, etc.)
- CONTINGENCY: a criterion or condition that must be satisfied (Success of an exploration well, Receipt of regulatory approval, etc.)
- DECISION RULE, statement of a condition that determines if a contingency has been satisfied.



5

A BASIC RESOURCE SUPPLY SYSTEM (RSS)

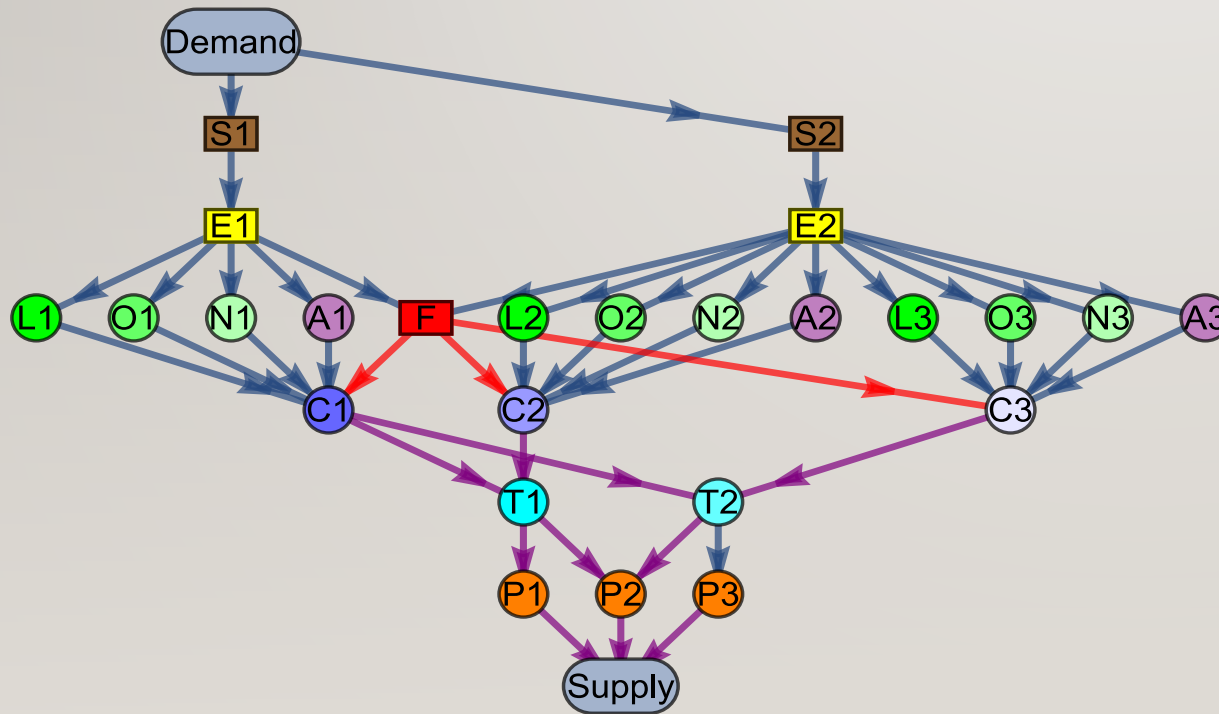
HWES Human World Economic System
BLUE BOXES Elements of the RSS
GREY BOXES Outside the RSS
DEMAND Entry point to the RSS
SUPPLY Exit point from the RSS



6 SIMPLE RSS NETWORK MODEL

Nodes: contain Agents (Operating agents, Financial agents, etc.)

Links: carry information between Nodes, (Quantity of resource, Financial etc.)



S Source

E Entitlement

F Finance

L Legal & Reg

O Social

N Environmental

A Political

C Production

T Transport

P Processing

Valuation is at every step, not shown

7 RSS IS A **COMPLEX** SYSTEM

- RSS is NOT simple linear, may:
- Have **Emergent properties** not apparent from its components considered alone (Starling murmurations!)
- Exhibit the “**Butterfly effect**”, a small change in initial conditions can result in large differences in a later state.
- Suffer from **Cascading changes** when a change in one component ripples through the system.
- Have **Critical transitions**, abrupt changes at a threshold value (Tipping points, possibly an extreme “Black Swan” event).

8 EXAMPLES OF APPLICATIONS

- Holistic view of the Resource Supply System for discussions, debates, and decisions.
- Track the movement of resource quantities, money, and values, etc.,
- Management of resource supply
- Analysing impact of perturbations, e.g., the impact of a two year delay in project construction, shortfall in source rate or quality, extreme events, failure of some links or nodes, etc.
- How do you develop a robust system?
- Build a Network or an Agent Based Model
- Etc.

REFERENCE, EGRM ROOM DOCUMENT

EGRM-14/2023/INF.2 – The Resource Supply System: Components, Structure, Dynamics - authored by David Elliott

- A: INTRODUCTORY
- B: COMPONENTS OF THE RESOURCE SUPPLY SYSTEM,
- C: CONCEPTS
- D: COMMUNICATION
- E: THE STRUCTURE AND DYNAMICS OF THE RESOURCE SUPPLY SYSTEM,
- F: POTENTIAL APPLICATIONS
- GLOSSARY
- REFERENCES