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Recommendations
for the Incorporation of
MOPPS-Like Detail into the
BNL/DRI Model

**Resource Planning
Associates**

**International Energy
Associates Limited**

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Fundamental Purpose of Energy Planning

-
- **Identify a Portfolio of Economically, Environmentally, and Socially Acceptable Actions That Will Ensure Adequate Energy for Each Market Sector, in Each Region, in Each Time Frame.**

● Major Planning Tasks

- **Specification of Portfolio Actions**
- **Definition of Acceptability (Selection Criteria)**
- **Ranking Alternative Portfolios**

Portfolio Actions

● RD and D Investments

● Taxes or Subsidies

● Tariffs or Quotas

● Standards

● Mandatory Allocation/Rationing

● Prohibition Orders

● Federal Purchases, Stockpiling, or Sales

Selection Criteria

- Healthy Economic Growth: Standard of Living and Employment
- Environment
- Reduce Vulnerability to *Potentially Damaging* Embargoes
- Fairness: Distribution of Burden

Modeling (Non-RD&D) Policy Actions Using BNL/DRI

Action	Level of Action	BNL/DRI Method	Modification
Taxes or Subsidies	National	Change in Aggregate Resource Prices	
	Regional, State, and Local	N/A* Some Regional Modeling Available 9/77	Regionalization
Tariffs or Quotas	Imported Energy	Set Quantity Constraints or Change Price	
	Imported Goods	(In DRI)	
Standards	Process Efficiency	Change Demand End-Use Efficiency (Coefficient in BESOM)	

* Not Available

Modeling (Non-RD&D) Policy Actions Using BNL/DRI

(Cont'd.)

Action	Level of Action	BNL/DRI Method	Modification
Mandatory Allocation/Rationing/Prohibition Orders	National	Constrain Fuel Availability by Type	
	Regional	N/A	Regionalization
	Sectoral	Constrain Fuel Utilization by Type by Sector	
Federal Purchase, Stockpiling, or Sales	Petroleum Storage	Changes in Demand for Buildup Changes in Supply after Buildup	
	Leasing of Federal Lands	Modification to Supply	

ERDA Planning: RD&D Investments

- Major Requirement: Evaluate Potential RD&D Investments in the Context of the Complete Portfolio of Government Actions

Note: Relationships Between RD&D Investment and Results of Investment (Over Time) Must Be Specified

- Comparison of MOPPS and BNL/DRI

	Strength	Weakness
MOPPS	<ul style="list-style-type: none">● Detail● Direct Program Orientation	<ul style="list-style-type: none">● Partial Analysis (Consistency)
BNL/DRI	<ul style="list-style-type: none">● Completeness	<ul style="list-style-type: none">● Difficulty in Disaggregation

ERDA Planning: Alternatives to Incorporate Necessary Detail

- **Develop Expanded High Detailed Model (i. e. New Model or Major Modifications to One of BNL/DRI, PIES, SRI, WHARTON II, etc.); or**
- **Develop Hierarchy of Independent Models**

An Hierarchical Framework

Level	Production Function	Use	Existing Models
0	$F_p(K, L)$	Mainly Pedagogical	
1	$F_p(K, L, E)$	Value Share of Energy and the Economy (Substitution)	Hogan/Manne Elephant-Rabbit
2	$F_p(K, L, E, M)$	Extension of Level 1 to Include Direct Material Substitution	Hudson-Jorgenson
3	$F_p(K, L, E_1, \dots, E_m, M_1, \dots, M_k)$		
4	$F_p(K, L, E_{1j}, \dots, E_{nj}, M_{1j}, \dots, M_{kj})$	Higher Detail but Fixed Coefficients	Illinois
4'	<div> $E_{1j}, \dots, E_{nj}$ (BESOM?) </div> <div> $M_{1j}, \dots, M_{kj}$ (Steel?) </div>	Process Detail	BESOM

Major Recommendation

ERDA Adopt a Hierarchical

Framework for the Future

Development of the BNL/DRI

Model

Management Plan

● Necessary Tasks

● Exact Hierarchy Design for ERDA Needs

- Transition Rules, Conditions for Consistent Communications Between Levels
- Theory of Transition Rules

● Accounting and Modeling Rules for Each Level

● Analogous Transition Rules for Demand

● Default Procedures for Missing Elements

● Software Tools to Aid System

● Priority System for Development of Detail Models

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