

# A Multi-Entity Model for Managing Asset Decommissioning



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# Case Study: Managing Asset Decommissioning

## Portfolio Model Solution

### Objectives / Scope

- **Complex Decision Networks:** Shared infrastructure, Multiple-Party Interests, New Investments, Tax-credit Utilization
- **Options:** Balancing New Investments and Decommissioning Optionality

### Methods / Procedures / Process

- Portfolio Model based on **Linear Programming**
- **Assess Value** at Multiple Levels of the Problem: Asset – Hub – Entity – JV Decisions

### Results, Observations, Conclusions

- **Cessation of Production Timing** – Implications Across Ownership Pools
- **Tax Considerations** (Application of Prior Losses) – Significant Driver to Value
- **Portfolio Optimization** Consistently Delivers Higher Value Decisions than Asset Level Assessment or Ranking

### Novel / Additive Information

- **Individual Asset Analysis / Stand-alone Decisions** Commonly Applied
- Greater Accessibility to Linear-Programming Tools and Methods – **Accelerate Analysis – Scenarios / Options**

# Case Study: Managing Asset Decommissioning

## Business Problem

### **Assessing value individually at the hub or asset level**

- *Fails to leverage value from portfolio interactions (between Assets, Hubs, Entities)*
- *Time Intensive – Limits Ability to Assess a Wide Range of Investment Options or Scenarios*

### **Value Potential in Portfolio Modeling**

- Tax credit utilization
- Investment allocation impacting abandonment timing
- Alternative strategies for asset development / abandonment
- Options – timing delays, acceleration
- Ownership options – Divestitures, Acquisitions, Alternative structures

# Case Study: Managing Asset Decommissioning

## Business Problem

### **Portfolio Model including all Assets**

- Aggregate computations at the Asset, Hub, Entity, or Multi-Entity
- Ability to Optimize (maximize) value given options in investments across entities
- Ability to assess value of groups of assets (hub level) or individual assets

### **Scenarios**

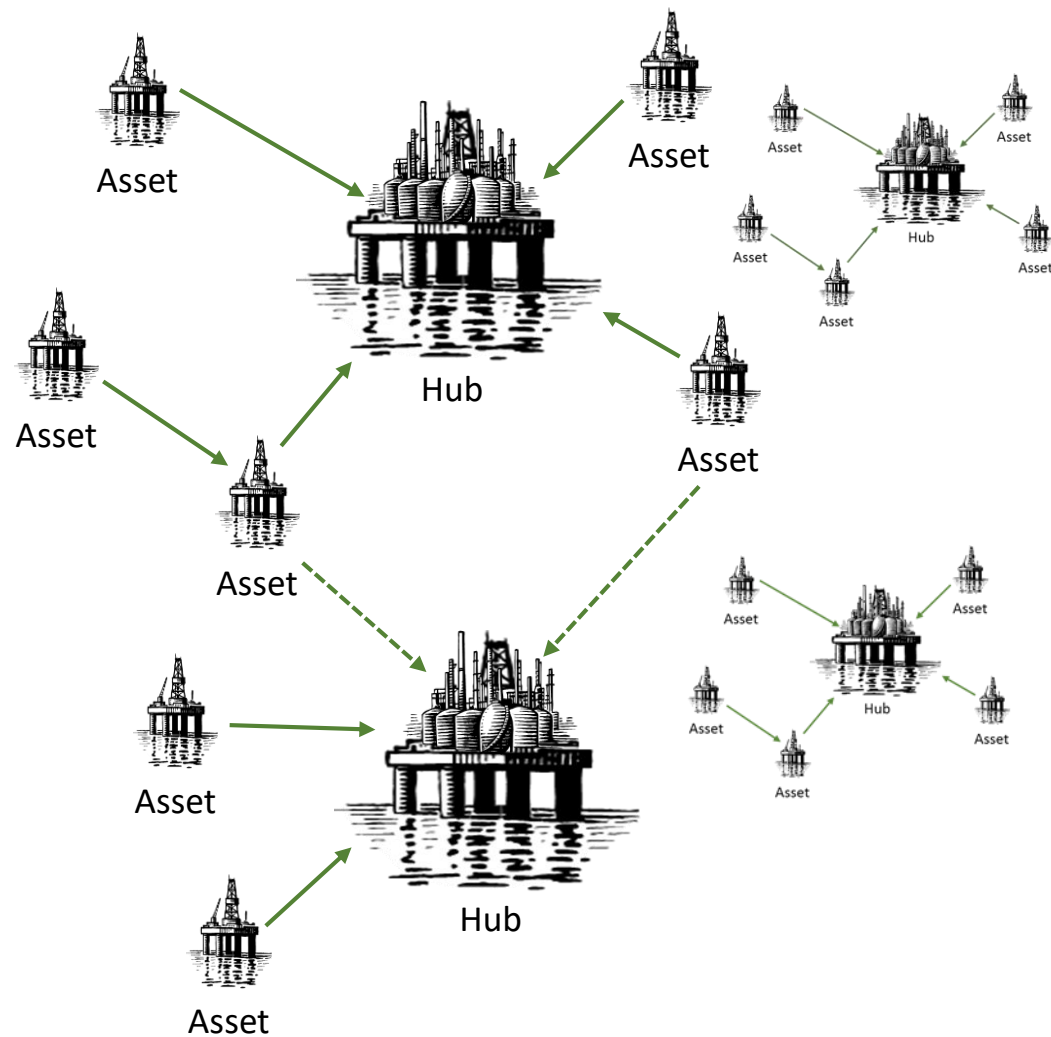
- Pricing sensitivities
- Allocation assumptions – Capex, Opex alternatives
- Alternative ownership structures

### **Significant value**

- Coordinated planning across entities – Which assets / hubs / platform investments to best delay (or accelerate) abandonment
- Consideration of tax credits in allocation decisions

# Case Study: Managing Asset Decommissioning

## Portfolio Model Components



**Company Ownership** comprised of X different **Entities**

### Options - Dependencies

Each **Entity** owns different working interests in each **Asset**

- Entities described by Tax position (taxes paid, Losses)
- **Assets** (specific fields, platforms)
- Each Asset associated with one or more Hubs
- Each **Asset** described by time series forecast metrics

### Scenario Analysis

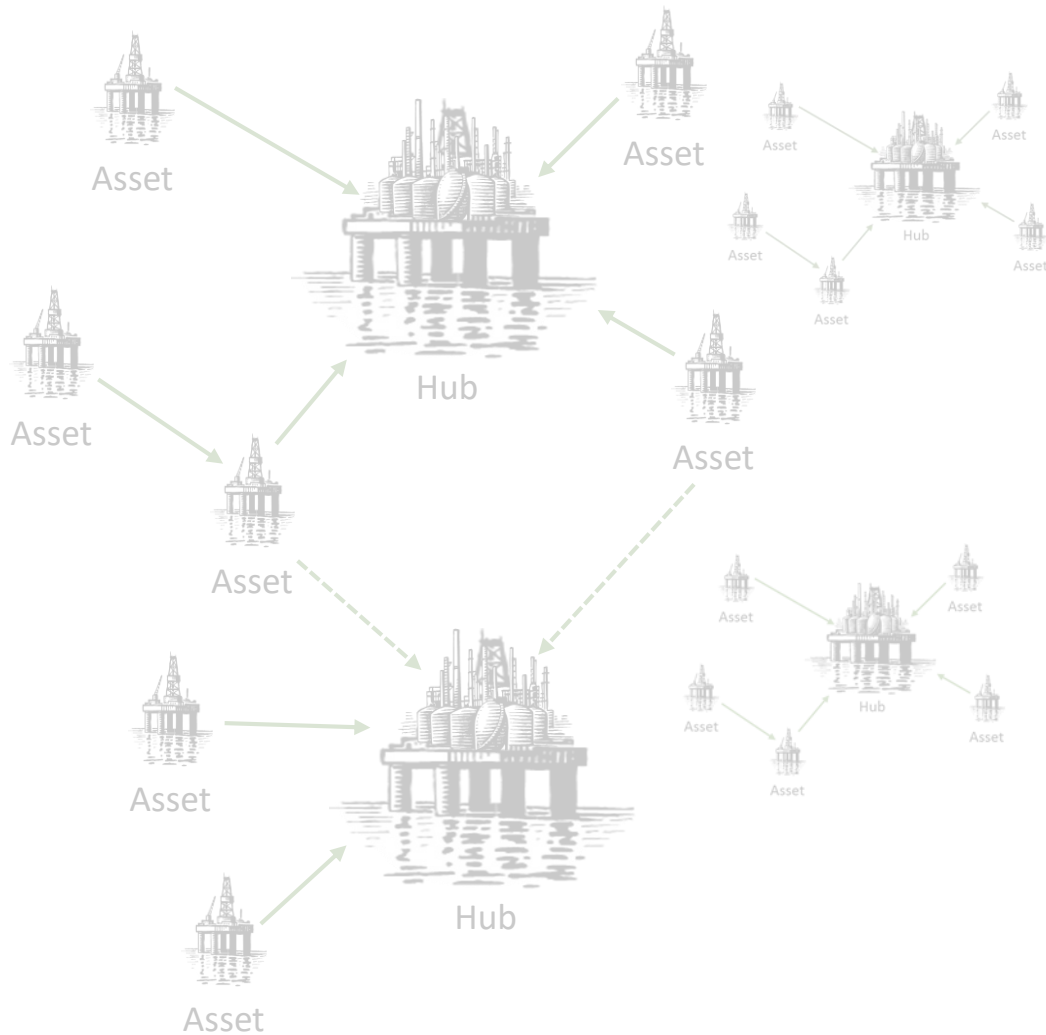
- Various Development Plans & Investment Options

### Optimization at the **Asset, Hub, and Entity** level

- Cessation of Production – at Hub or Asset level
- Valuation / Financials at - Entity, Combination of Entities, or JV

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## Portfolio Model Components

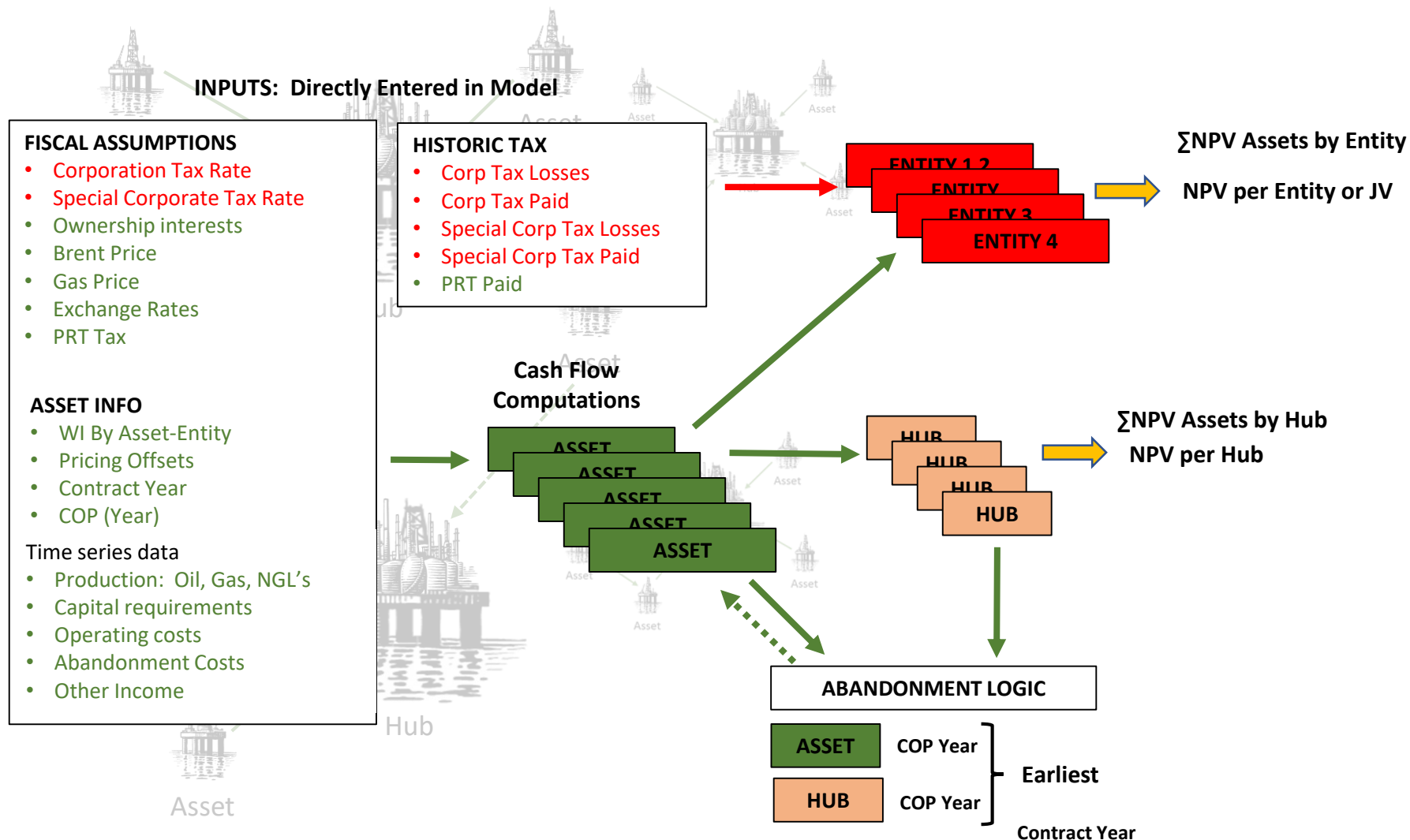


### Metrics

#### Decisions (at Company, Entity, or Asset levels)

- Net Present Value – Pre-tax, Post-tax
- Net Present Value – Pre-Abandonment, Post-Abandonment
- Free Cash Flow
- Discounted Profit to Investment (DPI)
- Production
- Operating Costs
- Unit Operating Costs
- Capital Investment
- Production efficiency (% utilization)
- Financial Measures – Income, debt, cash

# Case Study: Managing Asset Decommissioning Portfolio Model Computations



## Optionality

- Decommissioning Timing
- Additional Investment / Timing
- Tax Loss Considerations

## Scenarios

- Pricing Assumptions
- Ownership Assumptions (divestitures, restructuring)
- Capital Programs

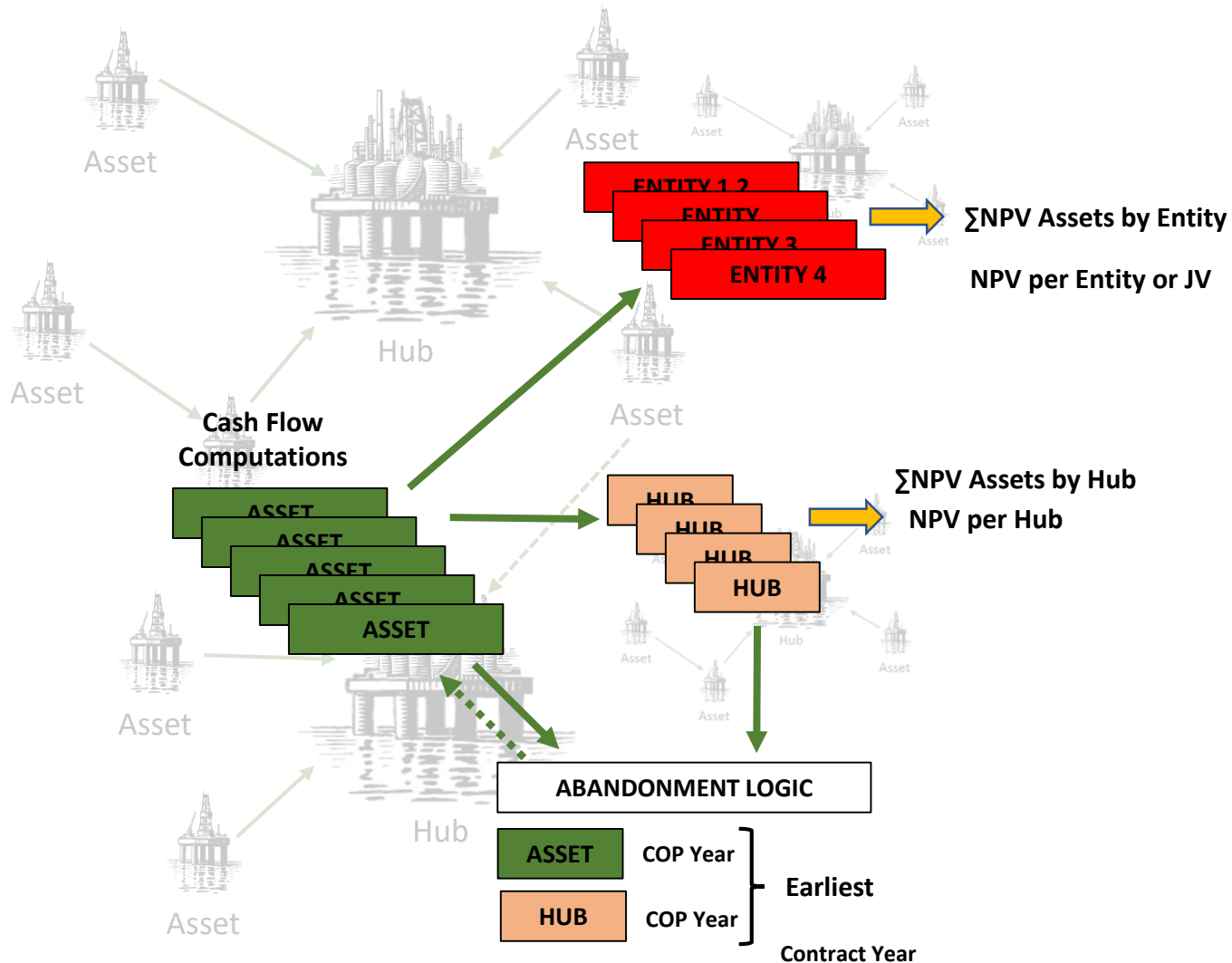
## Model optimized

- Maximize Value

## Multiple Objective Functions

- Minimize Capex Outlay
- Maximize Production

# Case Study: Managing Asset Decommissioning Portfolio Model Computations



## Iterative Calculations Optimization

### 1) Selection of Asset Investments

- Options
- Timing

### 2) Calculate Cessation of Production

- Asset
- Hub
- Contractual Limits

### 3) Use MINIMUM from above for COP timing

- Sets Abandonment Timing
- Abandonment in AT Net Cash Flow

### 4) Maximize Value (Cumulative AT NCF)

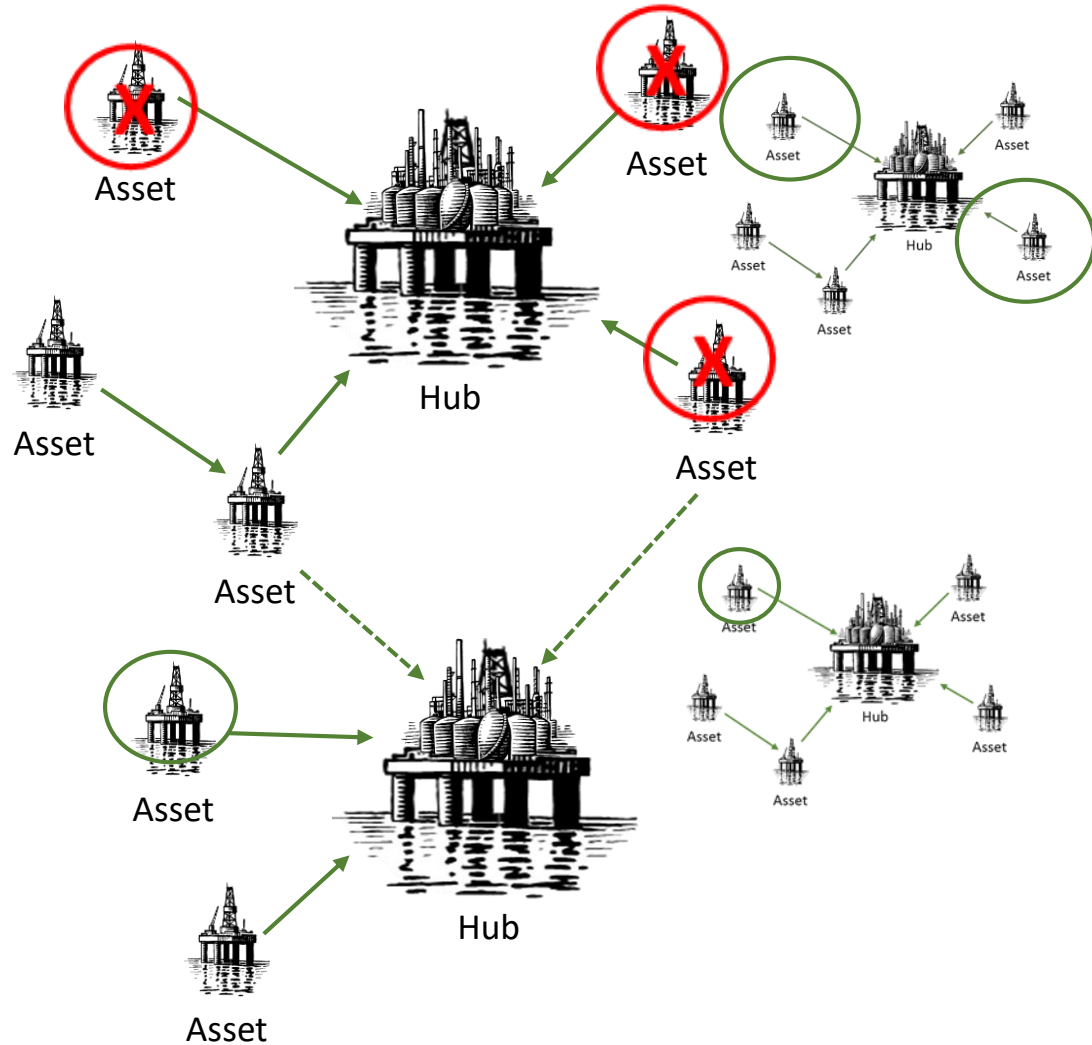
- Maximize Value

### Iterate (Compute Value)

- Compare Iterations to determine convergence



# Case Study: Managing Asset Decommissioning Portfolio Model Analysis



## Decisions

- Where to invest to delay COP
- Which Asset should be abandoned? When?  
Where to leverage 'Entity' Tax credits"
- Which Assets should be divested?
- Can alternative sales points be utilized?

# Case Study: Managing Asset Decommissioning Results

## Value

- Robust model for assessment of the UK Assets
- Maximize VALUE: Optimization of COP, Abandonment timing, working interest, investment timing,...
- Enhanced ability to rapidly assess alternative scenarios
- Comprehensive portfolio model – Ability to assess Company interests from multiple perspectives

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