



## **Analysis & Planning/Complementary Pgm Sec. 999 Federal Advisory Committees**

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**John R. Duda, Director, SCNGO  
September 9-12, 2008**



# Outline

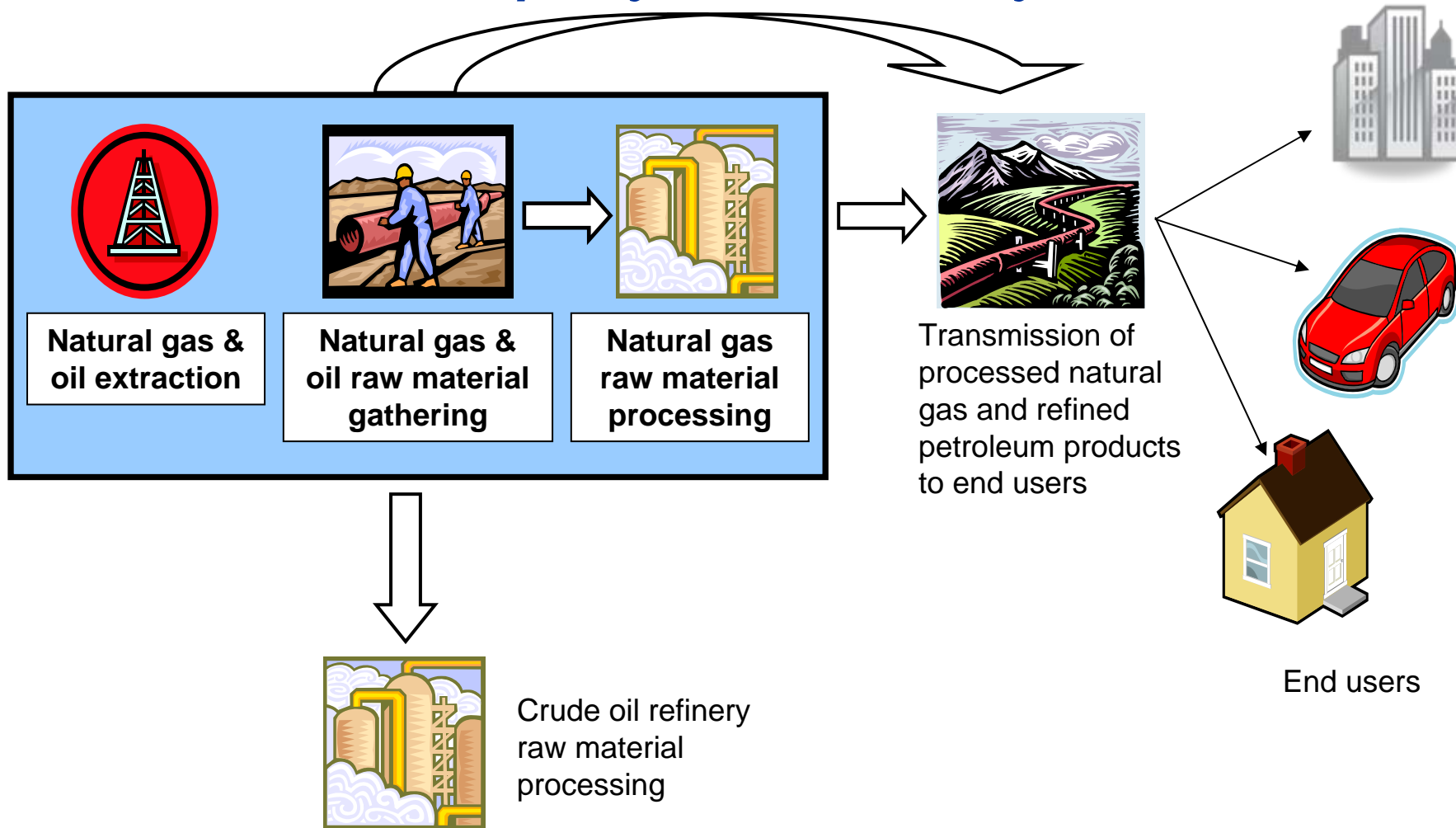
- **Systems Analysis and Planning**
- **Activities**
  - Valuing domestically produced oil and natural gas
  - Life Cycle Assessment of alternative transportation fuels
  - *PRB CBM MSC* update
  - Benefits assessment

# Systems Analysis and Planning

- **Analysis focusing on the future state of technologies, markets, and public benefits**
  - Evaluate attributes of energy technologies
  - Assess trends of energy production and use
  - Prospective and retrospective benefits analysis

# Valuing Oil and Natural Gas Production

## Scope/System Boundary



# Valuing Oil and Natural Gas Production

## *Project Details*

- **NETL and WVU**
  - Data analysis and model development
- **Project Schedule & Budget:**
  - Scheduled for completion: December 31, 2008
  - \$131K
- **Merit Review (September 5, 2008)**
  - Review methodology and model operation
  - Obtain feedback to improve project before moving into scenario analysis phase
  - “9.1”

# LCA Study Boundary

## PRIMARY INPUTS

### Fossil Energy Resources

Domestic Crude Oil  
(National Average)



Foreign Crude Oil  
(Saudi Arabia)



Coal  
(Illinois No. 6)



Oil Shale  
(Piceance Basin, CO)

### Non-Fossil Energy Resource



Biomass  
(Corn Stover)

### Other Resources



Inorganic Materials  
(e.g., Equipment/  
Infrastructure  
Construction)



Water

Equivalent Basis of Comparison:  
950,000 Passenger Vehicles Traveling  
12,000 miles per year from 2010 to 2030

**Pathway #1:** Extraction and refining from domestic crude oil. Pipeline transportation of fuel to bulk storage facility followed by truck transport to vehicle refueling station. Light-duty vehicle refueling and operation.

**Pathway #2a:** Extraction and import of foreign crude oil for domestic refining. Pipeline transportation to bulk storage facility followed by truck transport to vehicle refueling station. Light-duty vehicle refueling and operation.

**Pathway #2b:** Extraction of foreign crude oil with overseas refining to a finished product. Ocean vessel transport to the U.S. Pipeline transportation to bulk storage facility followed by truck transport to vehicle refueling station. Light-duty vehicle refueling and operation.

**Pathway #3:** Underground mining of coal. Coal-to-Liquids Plant converts coal to Fischer-Tropsch liquids. Pipeline transportation to bulk storage facility before truck transport to vehicle refueling station. Light-duty vehicle refueling and operation.

**Pathway #4:** In-situ extraction and processing of shale oil. Pipeline transport to a petroleum refinery for upgrading to finished product. Pipeline transportation to bulk storage facility before truck transport to vehicle refueling station. Light-duty vehicle refueling and operation.

**Pathway #5:** Underground mining of coal and biomass harvesting. Co-gasification of coal and biomass to produce Fischer-Tropsch liquids. Pipeline transportation to bulk storage facility followed by truck transport to vehicle refueling station. Light-duty vehicle refueling and operation.

## PRIMARY OUTPUTS

### Work Performed

Gasoline Vehicle



Diesel Vehicle



### Releases to Air

Greenhouse Gases

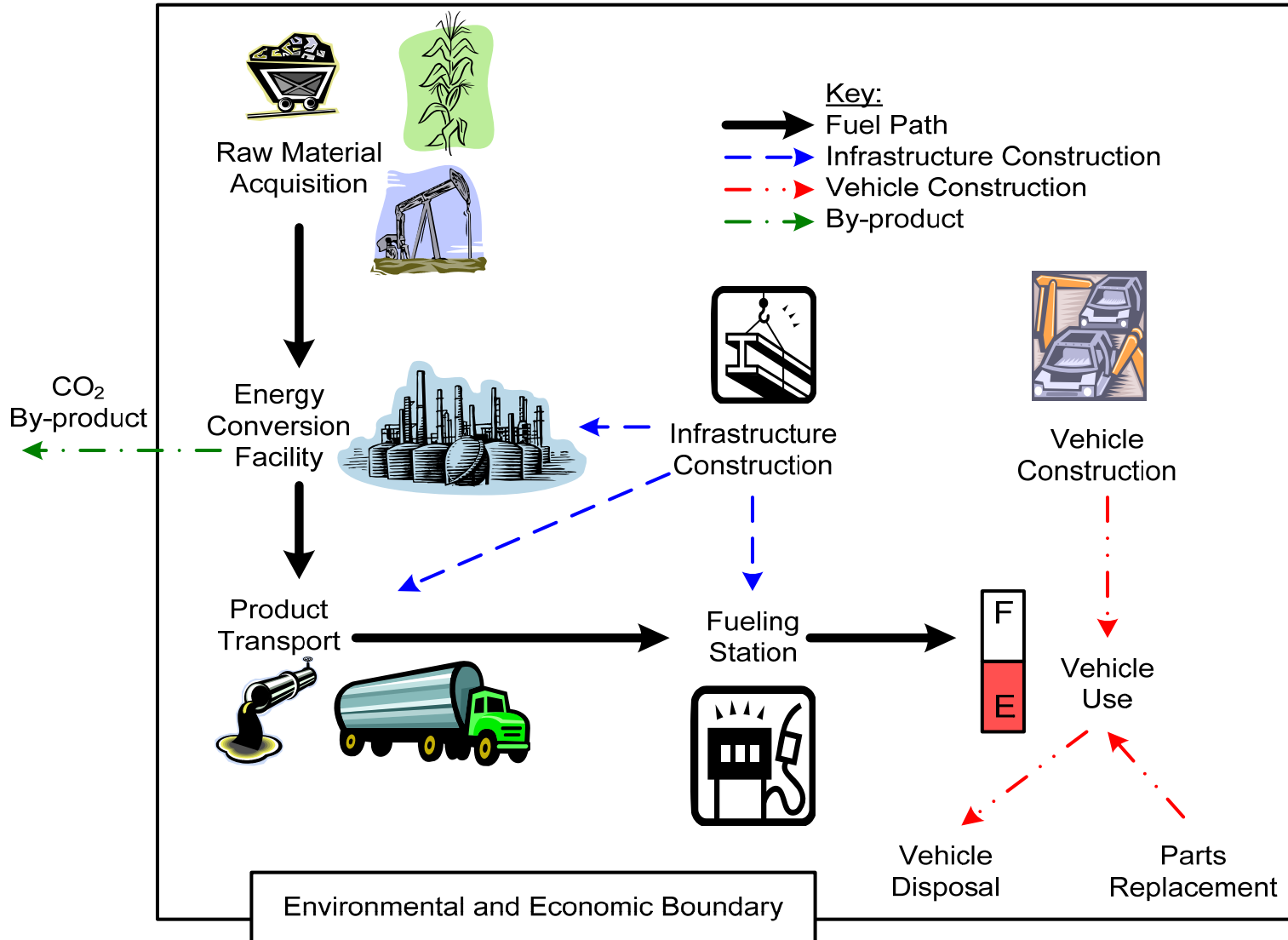
Criteria Air Pollutants

### Releases to Water

Water  
(Net Consumption)

Study Boundary

# LCA Conceptual Boundary



# Powder River Basin CBM MultiSeam Completion Study

## Results From All Townships in Partition 8

MSC Technology enables the *thin* (<20') coals in Partition 8 to be completed, increasing recoverable CBM by 2118 Bcf.

Coal Seam	Single Seam Completion		Multi Seam Completion	
	GIP (Bcf)	Recoverable Gas (Bcf)	GIP (Bcf)	Recoverable Gas (Bcf)
Smith	165	83	274	137
Swartz	143	71	294	147
Anderson	657	345	857	451
Canyon	1,434	1,008	1,625	1,142
Cook	1,378	1,059	1,710	1,315
Wall	1,132	912	1,508	1,214
Pawnee	663	551	1,230	1,023
L. Pawnee	268	223	540	449
Cache	102	85	511	424
Oedekoven	353	293	536	446
<b>Total</b>	<b>6,296</b>	<b>4,630</b>	<b>9,087</b>	<b>6,748</b>



# Benefits Analysis

## *“Framework”*

- **Develop project-level analyses**
  - Essentially develop a “business plan” for each project
  - Use existing methodology and data, as applicable
  - Embrace expert judgment where needed
  - Develop transparent calculations for market penetration forecasts and benefits
- **Once project level analyses are in hand, identify unifying themes, estimate aggregate benefits**
- **Collaborate with Dept. of Interior to derive royalty impact estimates**
- **Benefits assessments to evolve with the projects**

# Benefits Analysis

## *“Milestones”*

- **Assess portfolio of projects**
- **Evaluate applicability of models**
- ***Appreciate* data requirements**
- ***Secure global* data**
- **Select preferred methodology for approach**
- **Test model**
- **Merit review (planned for January 2009)**
- **Initiate scenario analysis**

# Complementary Program

## *...continued*

- **Questions?**
- **David Wildman**
  - Office of Research and Development