



Coal Transportation Issues and Opportunities

Benchmarking Study

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Prepared by **Norbridge**
30 Monument Square
Suite 300
Concord, MA 01742
978-831-1149
www.norbridgeinc.com

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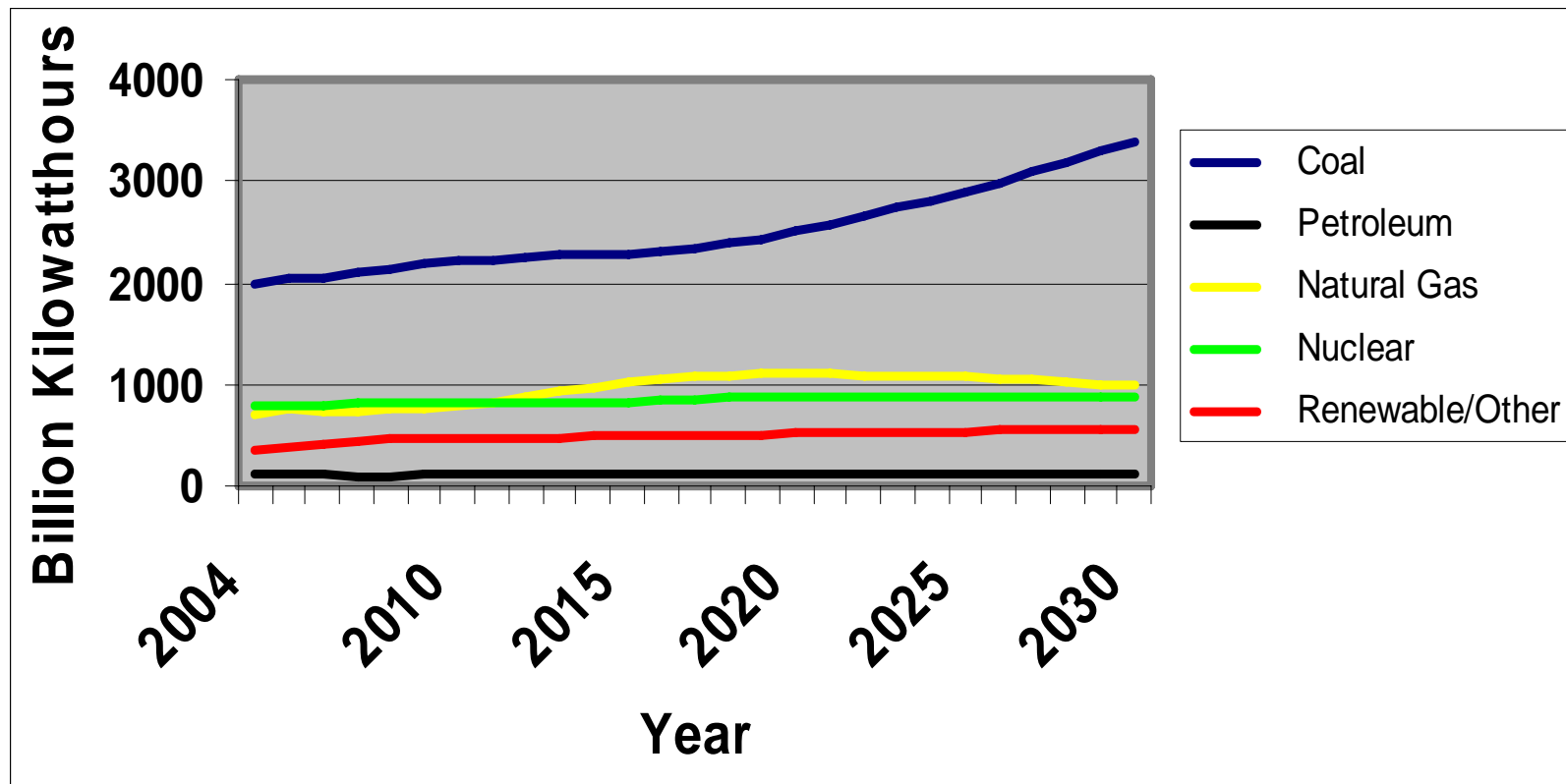
Study Background

- **Norbridge, Inc. is a management consulting firm that has considerable experience in both the energy and transportation industries.**
- **We have assisted utilities, coal companies, railroads, trucking companies and barge lines in both their planning and operations processes.**
- **We conducted this study because we wanted to better understand how utilities are preparing to manage the impending growth in coal volumes.**
- **The objective of this study is to bring issues and opportunities into focus while there is time to consider options and plan responses.**

Projected coal growth will put significant pressure on the coal transportation supply chain.

- The EIA projects 700 million more tons by 2030.

Predicted Electricity Generation by Fuel Through 2030



Source: Energy Information Administration, Annual Energy Outlook 2006

To better understand this challenge, Norbridge recently interviewed fuel procurement and transportation managers at sixteen utilities.

- We surveyed companies on three categories of issues: equipment, facility, and transportation management.
- Phone interviews were conducted during November 2005 to February 2006.

Companies Interviewed

<ul style="list-style-type: none">■ AES■ Alliant■ Ameren■ Arizona Public Service Company■ Cinergy	<ul style="list-style-type: none">■ Consumers Energy■ DTE Energy■ Entergy■ First Energy■ LGE Energy■ Midwest Generation	<ul style="list-style-type: none">■ NIPSCO■ Progress Energy■ Salt River Project■ SCANA■ Xcel Energy
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The survey focused on all coal transportation modes (e.g. rail, barge, truck, vessel), but many of the comments were rail-related.

Survey Topics by Category

Equipment Management	Facility Management	Transportation Management
<ul style="list-style-type: none"> ■ Equipment adequacy and availability ■ Maintenance ■ Railcar readiness for loading ■ Equipment quality and condition ■ Equipment utilization and productivity ■ Performance measures 	<ul style="list-style-type: none"> ■ Maintenance ■ Productivity ■ Facility availability and utilization ■ Performance measures ■ Days of supply ■ Outsourcing 	<ul style="list-style-type: none"> ■ Process times and consistency <ul style="list-style-type: none"> – Arrival at power plants to departure – Power plants to mines, and back to plants – Coal mines – time from equipment arrival to departure ■ Communication and responsiveness ■ Asset availability

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■ **Equipment Management**

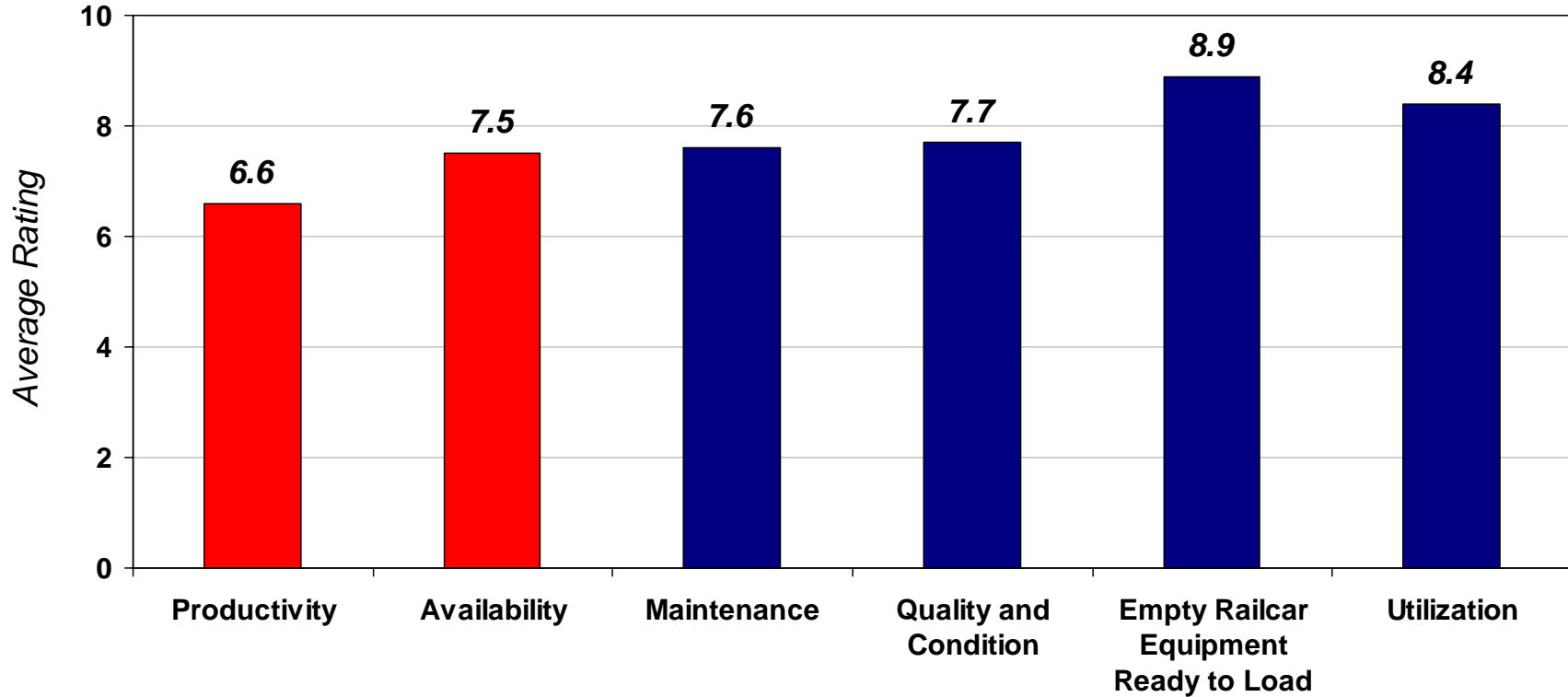
■ Facility Management

■ Transportation Management

III. Implications

Productivity and availability were the equipment management issues of greatest concern to the utilities surveyed.

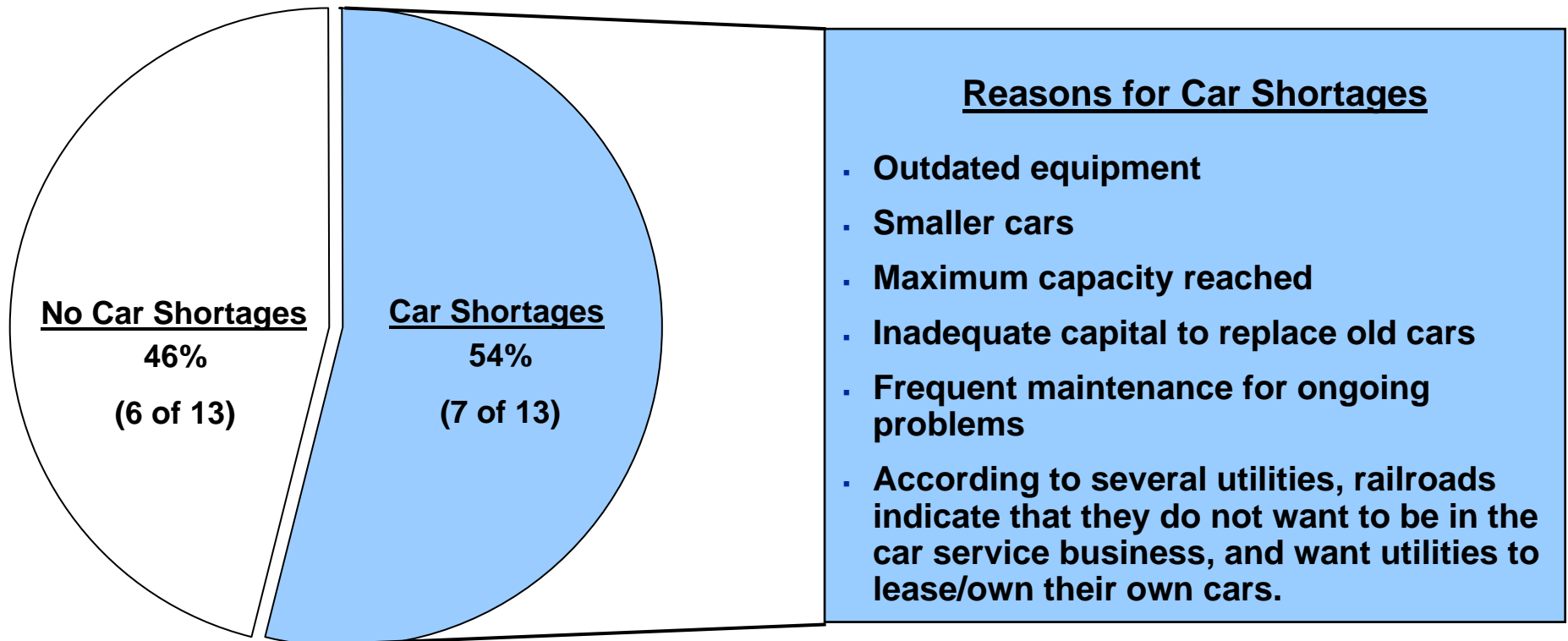
Equipment Management Activities
 (Ratings Based on 1-10 Scale with 1=Poor and 10=Excellent)



	Productivity	Availability	Maintenance	Quality and Condition	Empty Railcar Equipment Ready to Load	Utilization
Number of Respondents:	16	16	15	16	12	16
Range of Answers:	2-10	3-10	5-9	5-10	6-10	7-10
% of Answers 5 or Less:	38%	25%	13%	13%	0%	0%

More than half of the utilities surveyed indicate that they are facing railcar shortages.

**Adequacy of Railcar Fleet to Meet Utility Needs
13 Utilities**



Some utilities are adding new train sets, while others are ensuring that empty cars are “ready to load”, but many are not adding equipment.

Equipment Additions

- **Eight utilities surveyed have increased the number of railcars they either own or lease in the last 3-5 years (one by three train sets), while six utilities plan on increasing their fleet in the next 3-5 years.**
- **However, eight utilities did not add equipment in the last 3-5 years, and ten utilities have no plans to add new cars in the next few years.**

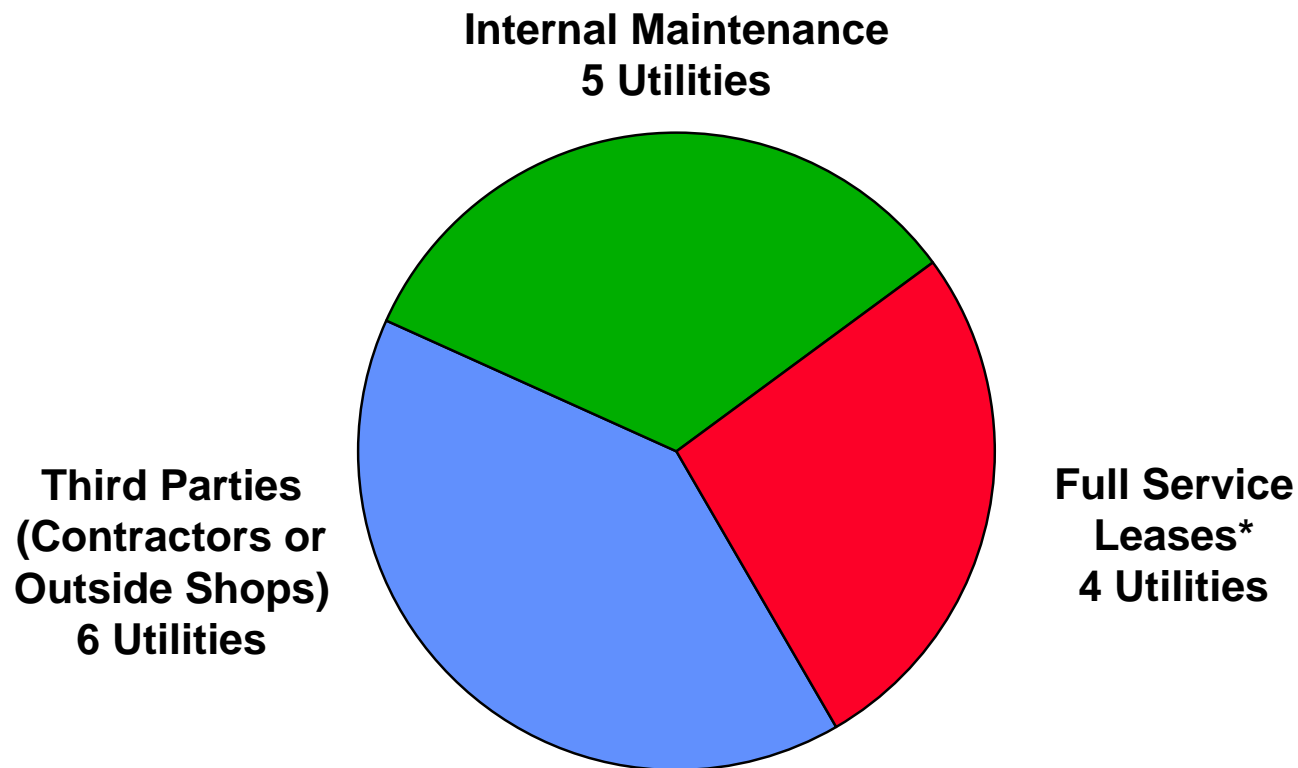
Equipment Ready to Load*

- **Nine utilities with bottom dump cars indicate that they are focused on making sure that car doors are closed and equipment is ready to load.**

* Several of the utilities surveyed operate gondolas which do not require railcar doors to be closed.

Utilities are using three distinct strategies to maintain their equipment.

**Equipment Maintenance Strategies
(Based on 15 Utilities Surveyed)**



* Utilities pay a premium to ensure that leasing companies maintain their equipment.

However, many utilities indicate that important equipment issues are not being addressed.

Key Equipment Issues That Could Limit Future Coal Tonnage

- **Slow process times**
 - 81% of utilities said that their process time at one or more of their plants was slower than they would like.
 - Of the 13 utilities with slow process times, 7 said that their process time had gotten worse in the last 3-5 years.
- **Outdated equipment**
 - Utilities are frequently “locked” into long term leases with aging cars, often due to shortages of capital for buying or leasing new train sets.
 - This requires more maintenance and shop time to keep cars running.
- **Small cars**
 - Certain cars have limited load capacity (263,000 pounds).
 - Other cars are not able to handle the stress of heavy usage.

They also indicated concern with equipment maintenance, and identified few performance measures in place to track equipment.

Key Equipment Issues That Could Limit Future Coal Tonnage (continued)

■ Equipment repairs/maintenance

- Older cars tend to have more problems and need more maintenance.**
- For several utilities, maintenance is becoming too frequent and costly.**
- Several utilities that need railcar upgrades did not get them because the company decided that it was too expensive.**

■ Performance measures

- Most utilities track equipment cycle times (loading, unloading, empty dwell times, time in transit).**
- However, eleven utilities surveyed do not have any key performance indicators for their equipment, aside from measuring cycle times.**

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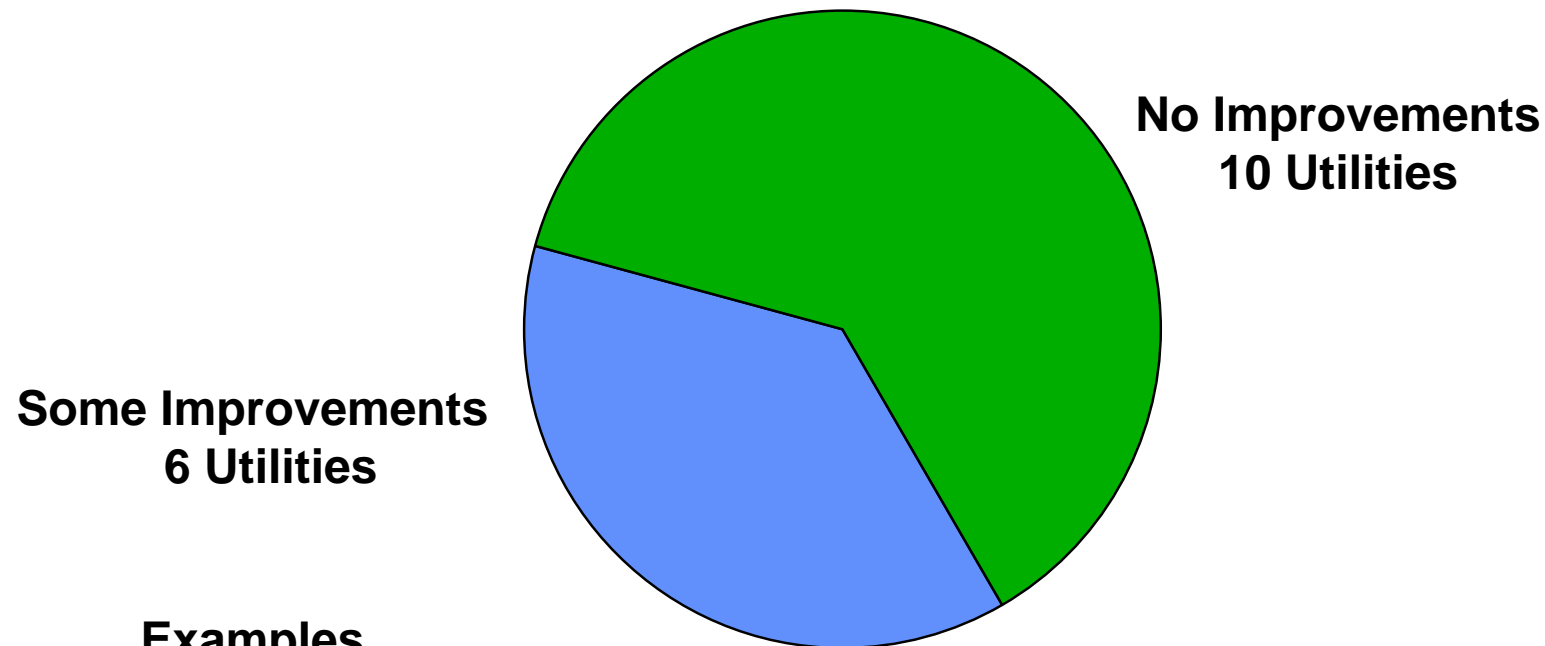
- **Facility Management**

- Transportation Management

III. Implications

Fewer than half of the utilities surveyed have taken action to update their facilities to handle the expected increases in coal volume.

**Utility Improvements at Coal Unloading Facilities in Recent Years
(Based on 16 Utilities Surveyed)**



Examples

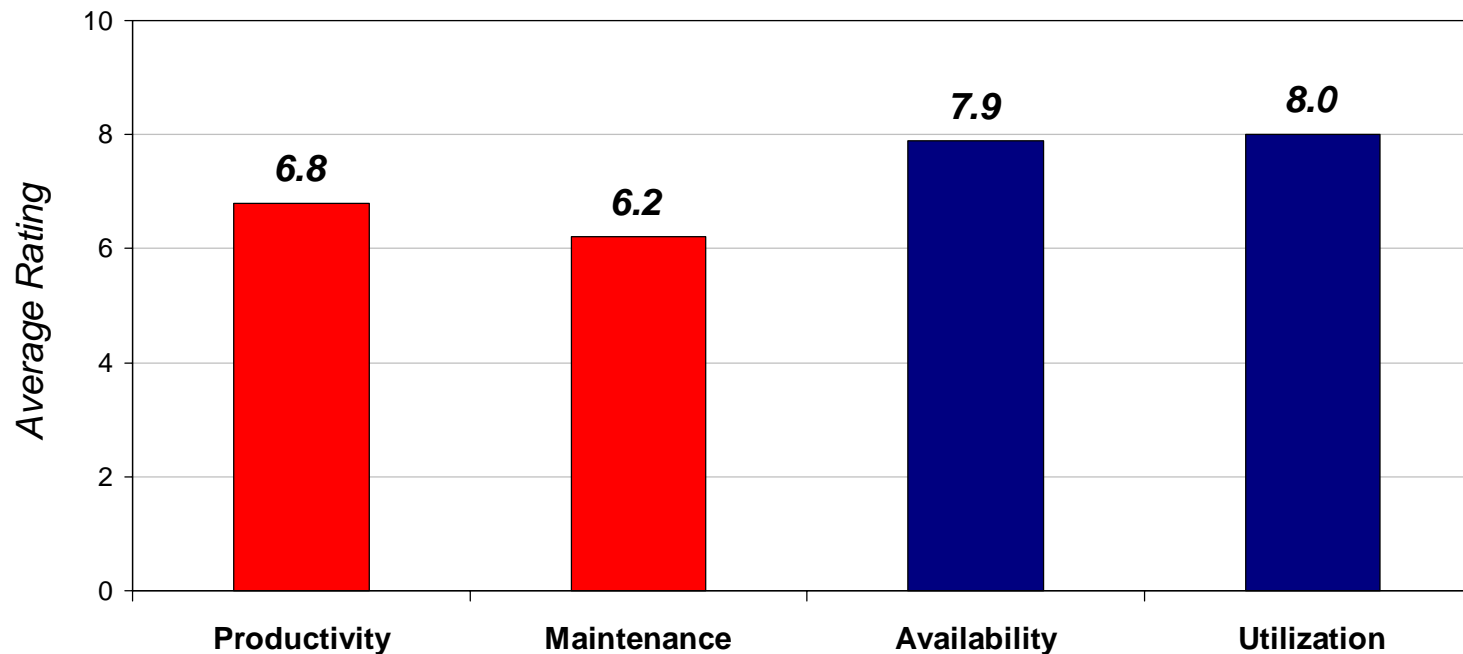
- More or longer tracks
- New or longer sidings
- Updated unloading facilities

Many utilities indicate concern with facility management issues, particularly productivity and maintenance.

- Capital shortages are a key driver of productivity and maintenance problems.

Facility Management Activities

(Ratings Based on 1-10 Scale with 1=Poor and 10=Excellent)



Number of Respondents:

14

15

15

15

Range of Answers:

3-9

2-9

3-9

5-10

% of Answers 5 or Less:

29%

33%

13%

7%

Utilities indicate that important facility issues are not being addressed.

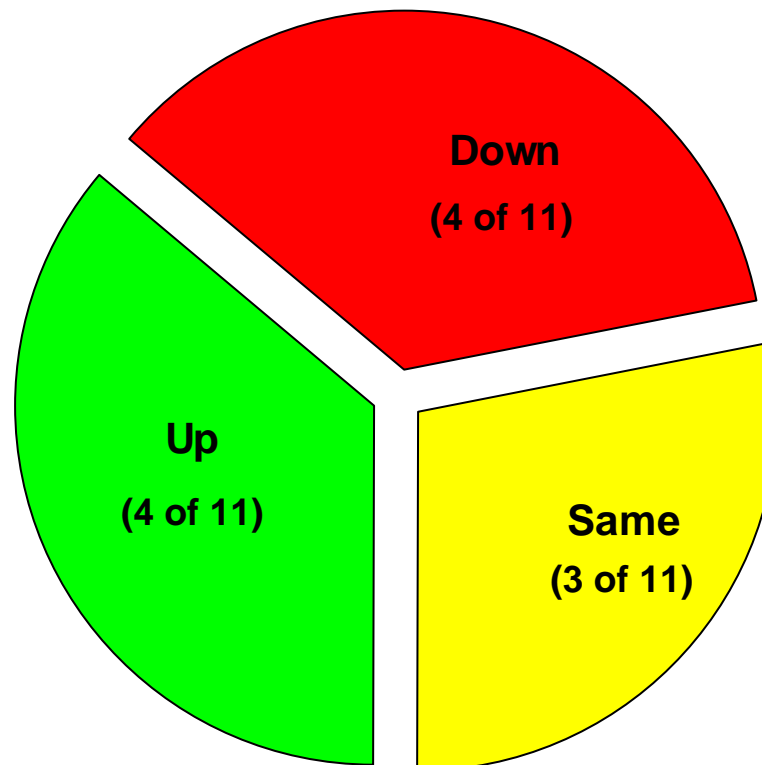
Key Facility Issues That Could Limit Future Coal Tonnage

- **Outdated facilities**
 - Eleven respondents commented that their unloading facilities are outdated, resulting in poor productivity.
 - Some facilities date back to World War II, without significant upgrades.
- **Limited maintenance**
 - Outdated facilities are resulting in more maintenance.
 - Many utilities indicate that they do not address problems until after they occur.
- **Capital shortages**
 - Outdated facilities are frequently not updated due to a lack of capital.
 - “The last thing on our company’s mind is putting money into coal operations.”
- **Performance measures – few are in place to track facility performance.**

Over two thirds of the utilities have changed their coal inventory levels (days of supply) over the last few years.

- 36% of utilities have increased their inventory levels in the last 3-5 years.
- 36% of utilities have decreased their inventory in the last 3-5 years.
- 27% of utilities have not changed their inventory levels.

**Changes in Coal Inventory Levels During Past 3-5 Years
11 Utilities**



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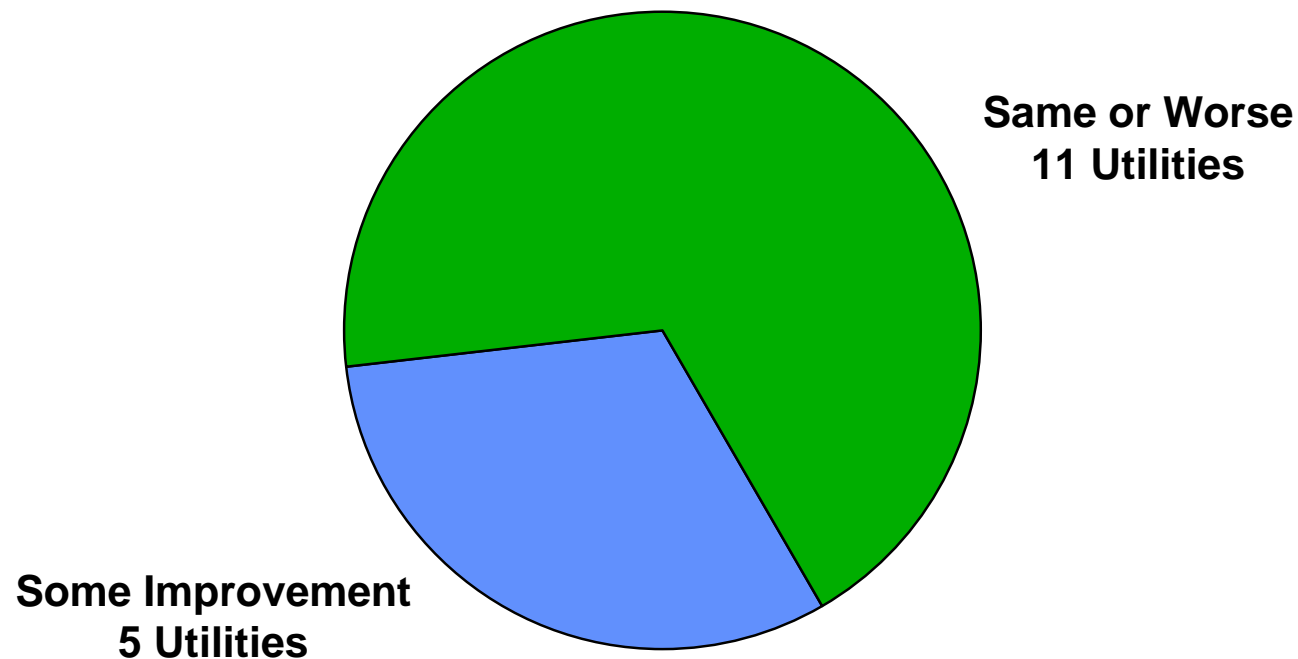
- **Transportation Management**

III. Implications

Five utilities indicate that process times at their unloading facilities have improved, but others say they have stayed the same or gotten worse.

- Utilities attribute poor process times to maintenance problems, older equipment, and railroad inefficiencies.

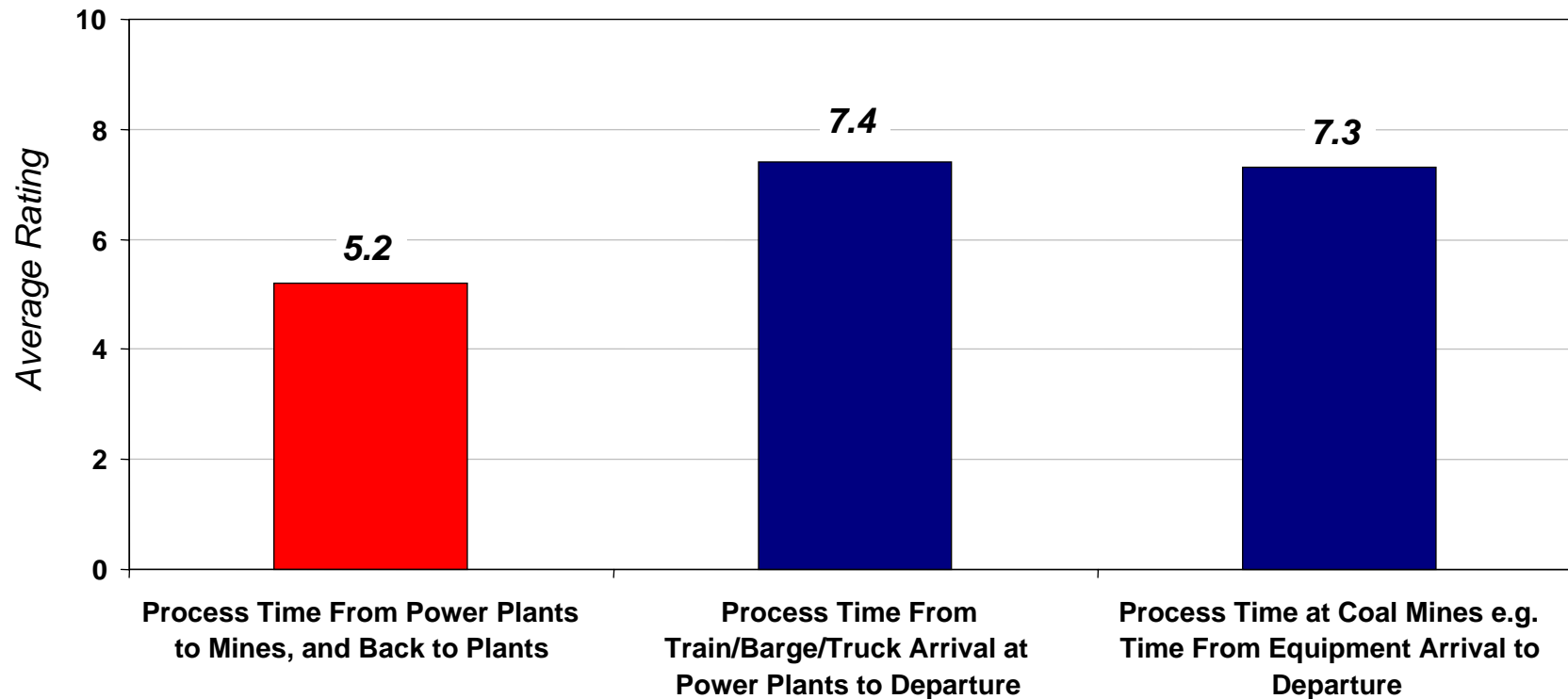
**Process Times at Power Plant Unloading Facilities in Recent Years*
(Based on 16 Utilities Surveyed)**



* Includes time from arrival of coal transportation equipment at power plant until departure.

There was a wide range of responses on transportation effectiveness, with particular concern about cycle times between mines and plants.

Transportation Management Activities
 (Ratings Based on 1-10 Scale with 1=Poor and 10=Excellent)



Number of Respondents:	16	16	16
Range of Answers:	1-8	3-10	4-10
% of Answers 5 or Less:	44%	19%	19%

Utilities rated performance of different transportation modes in five areas. They were particularly concerned about rail performance.

Performance Comparison Across Transportation Modes
(Ratings Based on 1-10 Scale with 1=Poor and 10=Excellent)

Issue	Number of Responses	Average	Range of Answers	% of Answers 5 or Less
1. Time in Transit				
Railroad	16	5.0	1-7.5	50%
Barge/Vessel*	9	8.3	6-10	0%
Truck	8	8.8	8-10	0%
2. Transit Time Consistency				
Railroad	16	4.8	2-8	56%
Barge/Vessel*	9	8.2	6-10	0%
Truck	8	8.6	7-10	0%
3. Communication				
Railroad	16	6.1	1-9	31%
Barge/Vessel*	9	8.4	6-10	0%
Truck	8	7.6	5-10	13%
4. Responsiveness to Issues/Problems				
Railroad	16	5.8	1-9	38%
Barge/Vessel*	9	8.3	6-9	0%
Truck	8	8.0	5-10	13%
5. Information on Shipment Status				
Railroad	16	7.2	3-10	31%
Barge/Vessel*	9	8.7	5-10	6%
Truck	8	7.1	3-9	13%

***Includes eight responses for barge and one for vessel. Responses have been combined for confidentiality purposes.**

Utilities indicate that important transportation issues are not being addressed.

Key Transportation Issues That Could Limit Future Coal Tonnage

- **Rail cycle time**
 - Ten utilities indicated that cycle times increased in the last few years.
 - Nine utilities indicated concern with late or inconsistent rail deliveries.
 - Cycle times are considered unpredictable.
- **Railroad communication and responsiveness**
 - Over one-third of utilities indicated frustration with railroad communication and responsiveness to issues/problems.
- **Railroad asset availability**
 - Utilities expressed concern about railroads' lack of crews, power and cars.

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Some utilities are making improvements to prepare for future increases in coal traffic, but many are not.

- Utilities highlighted a wide range of problems impacting their performance.

**Examples of Coal Transportation Issues and Problems Impacting Productivity
(Based on 16 Utilities Surveyed)**

Equipment Management	Facility Management	Transportation Management
<ul style="list-style-type: none"> ■ Slow process times ■ Outdated equipment ■ Small cars ■ Increased repairs ■ Car shortages ■ Few performance measures ■ Capital shortages 	<ul style="list-style-type: none"> ■ Outdated facilities ■ Limited maintenance ■ Capital shortages ■ Few performance measures 	<ul style="list-style-type: none"> ■ Slow process times from arrival at power plants to departure ■ Railroad performance <ul style="list-style-type: none"> – Transit times – Communication – Asset availability

Implications for Utilities and Other Coal Supply Chain Participants

Implications

- ***Many Are Not Prepared*** - Many power plants and transportation providers are not prepared to handle significant increases in coal traffic.
- ***The Time for Change is Now*** - In fact, many companies are facing problems even at current traffic levels.
- ***Equipment Reinvestment is a Necessity*** - Transportation equipment needs to be updated, maintained and managed more efficiently.
- ***Facility Modernization is a Necessity*** - Unloading facilities need to be modernized, maintained and more productive.
- ***Significant Need for Process Improvement*** - Process times need to improve significantly and become more consistent.
- ***Need for Operational Cooperation*** - All participants in the coal supply chain need to work closely and proactively to ensure that the transportation network can handle projected increases in coal volumes.

Norbridge



Lee Clair, Partner
312-961-4403
570 Lake Cook Road
Suite 301
Deerfield, IL 60015
lclair@norbridgeinc.com

Pete Fordham, Principal
978-831-1149
30 Monument Square
Suite 300
Concord, MA 01742
pfordham@norbridgeinc.com

www.norbridgeinc.com

