

## World of Coal Ash



# Benchmarking Study for CCP Beneficial Reuse: A View of the Market

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April 25, 2013

# Key Topics of the CCP Benchmark Study

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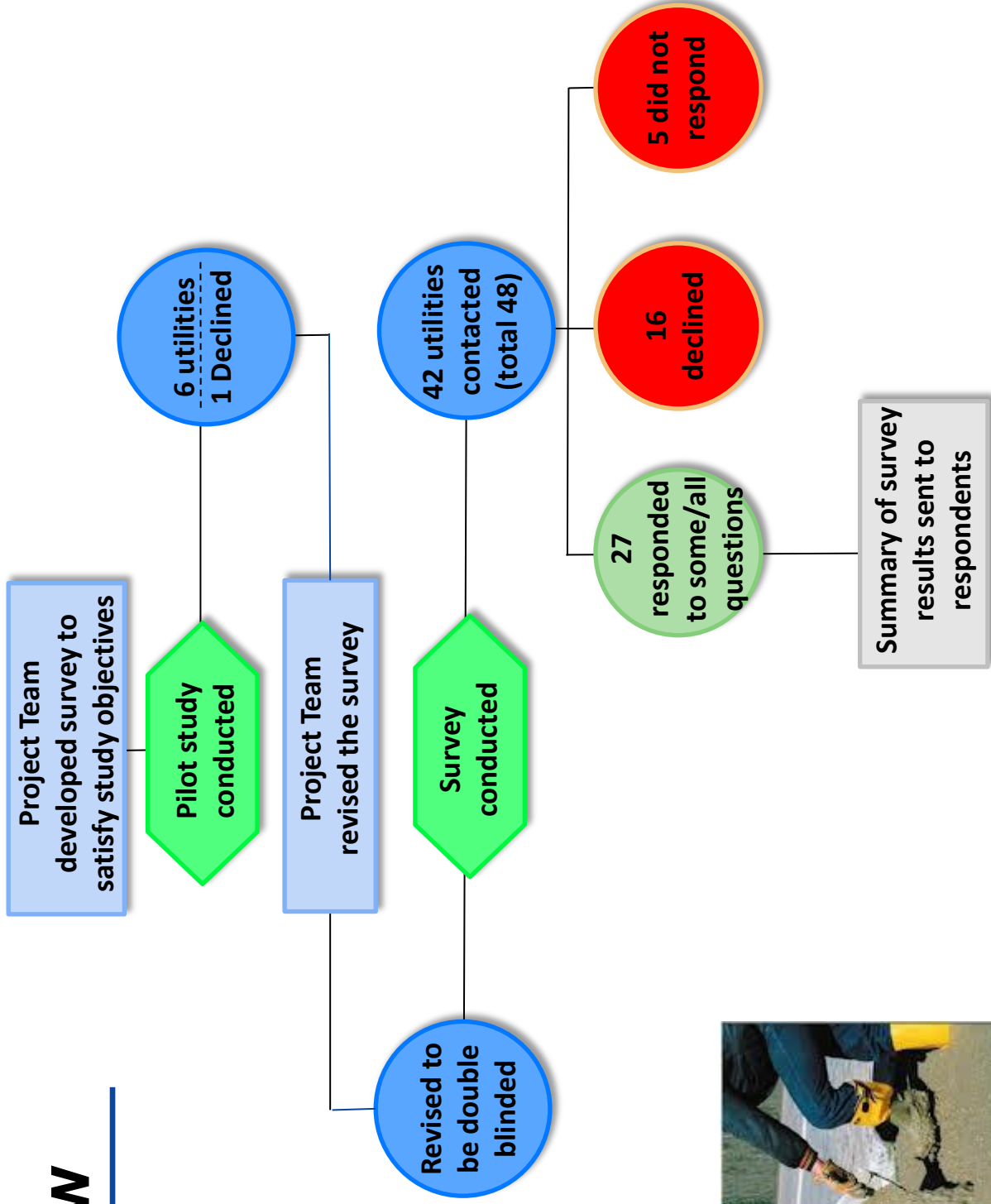
1. Overview of the Benchmark Study
2. How respondents compare to each other based on CCP production
3. Trends in the top 5 producers
4. Trends in the smaller producers
5. Impact of corporate policy on beneficial reuse
6. Trends in CCP revenue
7. Trends in subsidizing CCPs and how programs are subsidized
8. Utility challenges in CCP beneficial reuse
9. Trends that make marketers successful
10. Factors considered in financial decisions on CCP reuse or disposal
11. Strategies utilities use to improve and excel in CCP beneficial reuse

## Overview of the Process

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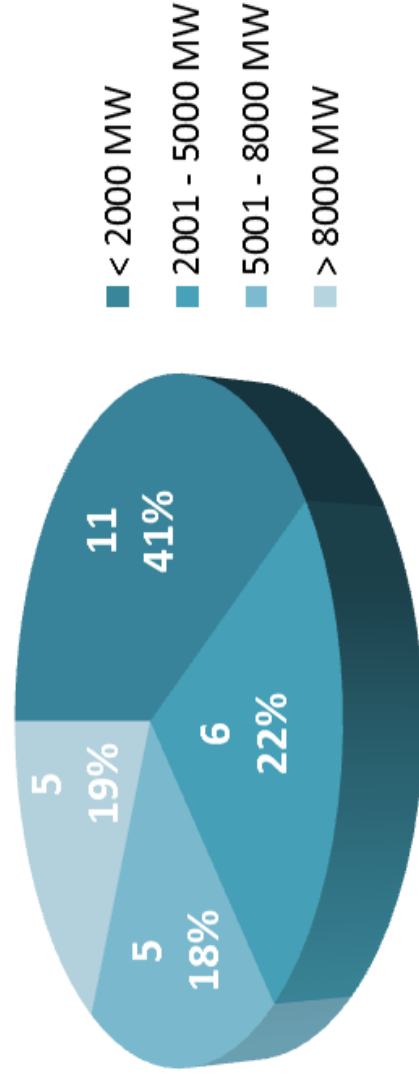
- The purpose of the benchmark study was to evaluate beneficial reuse of CCPs and identify best management practices, through a survey of the industry.
- The product of the study represents the best available data, most of which was reported to be from the year 2011.

# Overview



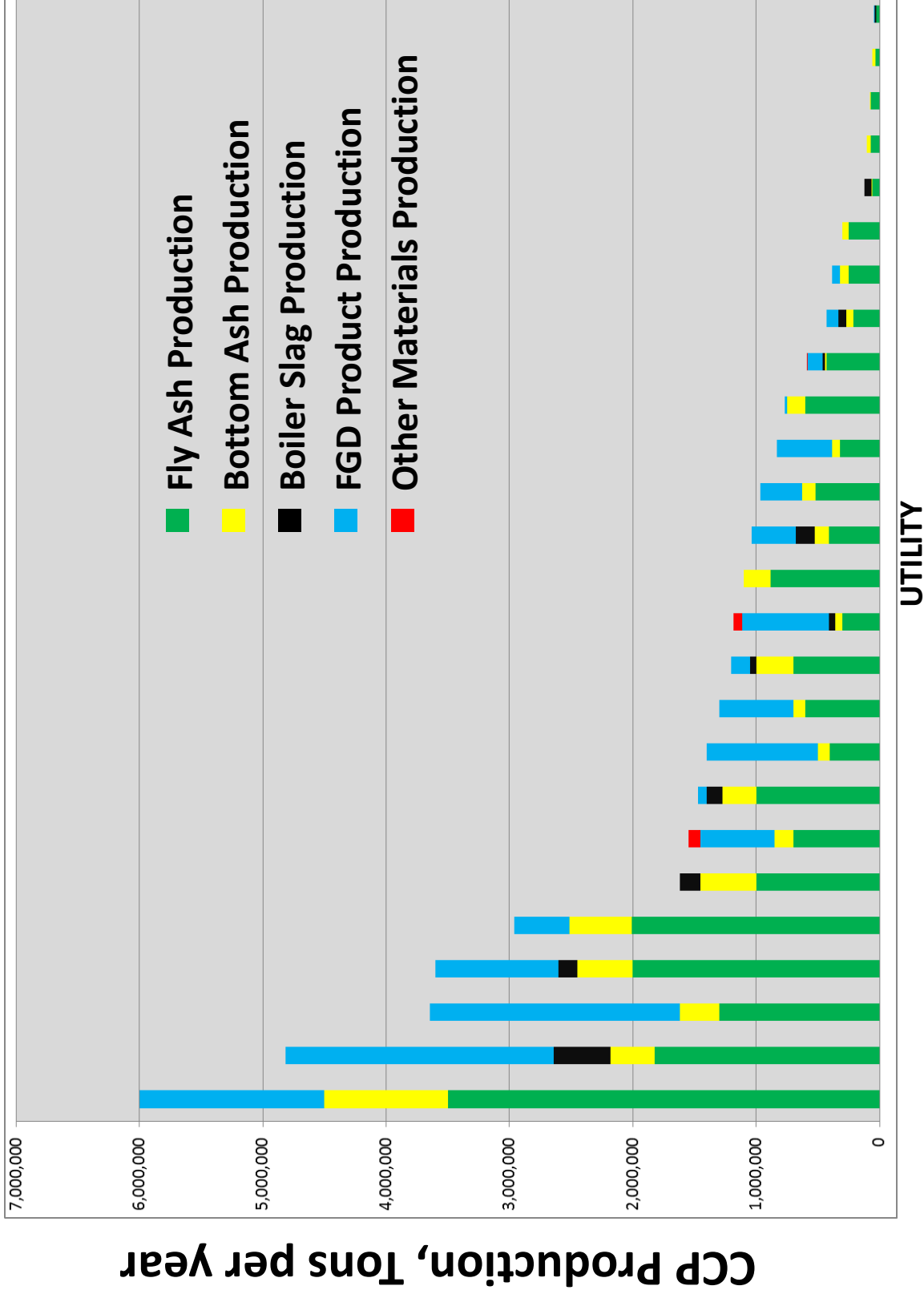
# Characteristics of the Respondents

- The respondents operated 1 – 20 coal power plants
  - 20 utilities operated 1 – 5 coal power plants
  - 2 utilities operated between 6 and 10 coal power plants
  - 5 utilities operated more than 11 coal power plants
- The respondents operating locations represented 31 states
- Operating Megawatts of the utilities ranged from 33 MW – 23,900 MW

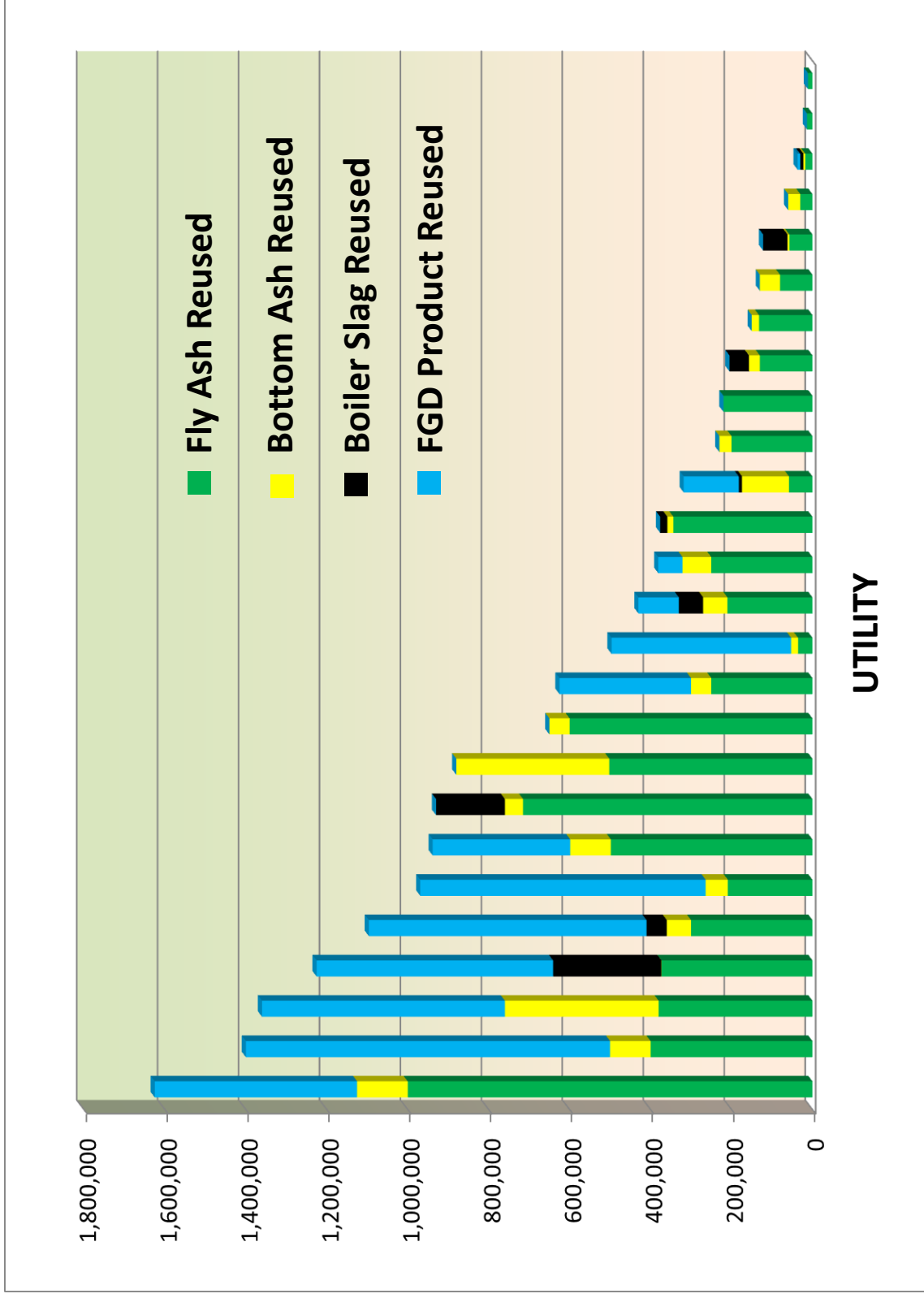


- Majority of the respondents were private sector companies

# Tons of CCPs Produced by the Respondents



# Tons of CCPs Beneficially Reused by Respondents

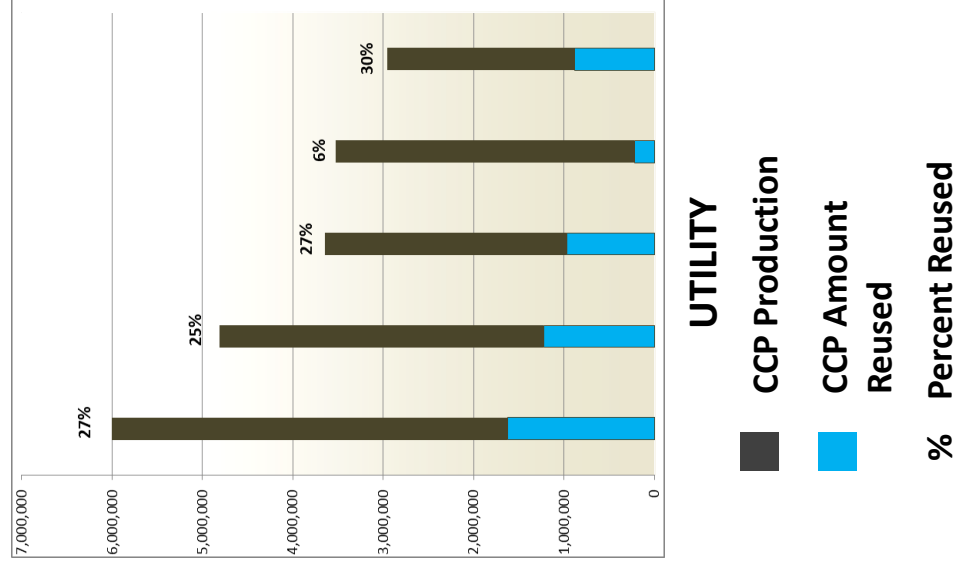






# Trends in the Top 5 Producers

CCP Production, tons per year



## Corporate policies:

- Four out of five have them
- Some have measurable goals

## Common significant factors included:

- Marketers have an established market with end users; regional presence; and integrated operation
- Marketers have good relationships with producers and end users
- A focus on short and long term utilization
- Integrated transportation and storage options (e.g., rail, barge, silo)
- Competitively bid contracts
- Most do not subsidize (unless for structural fill) and none benefitiate

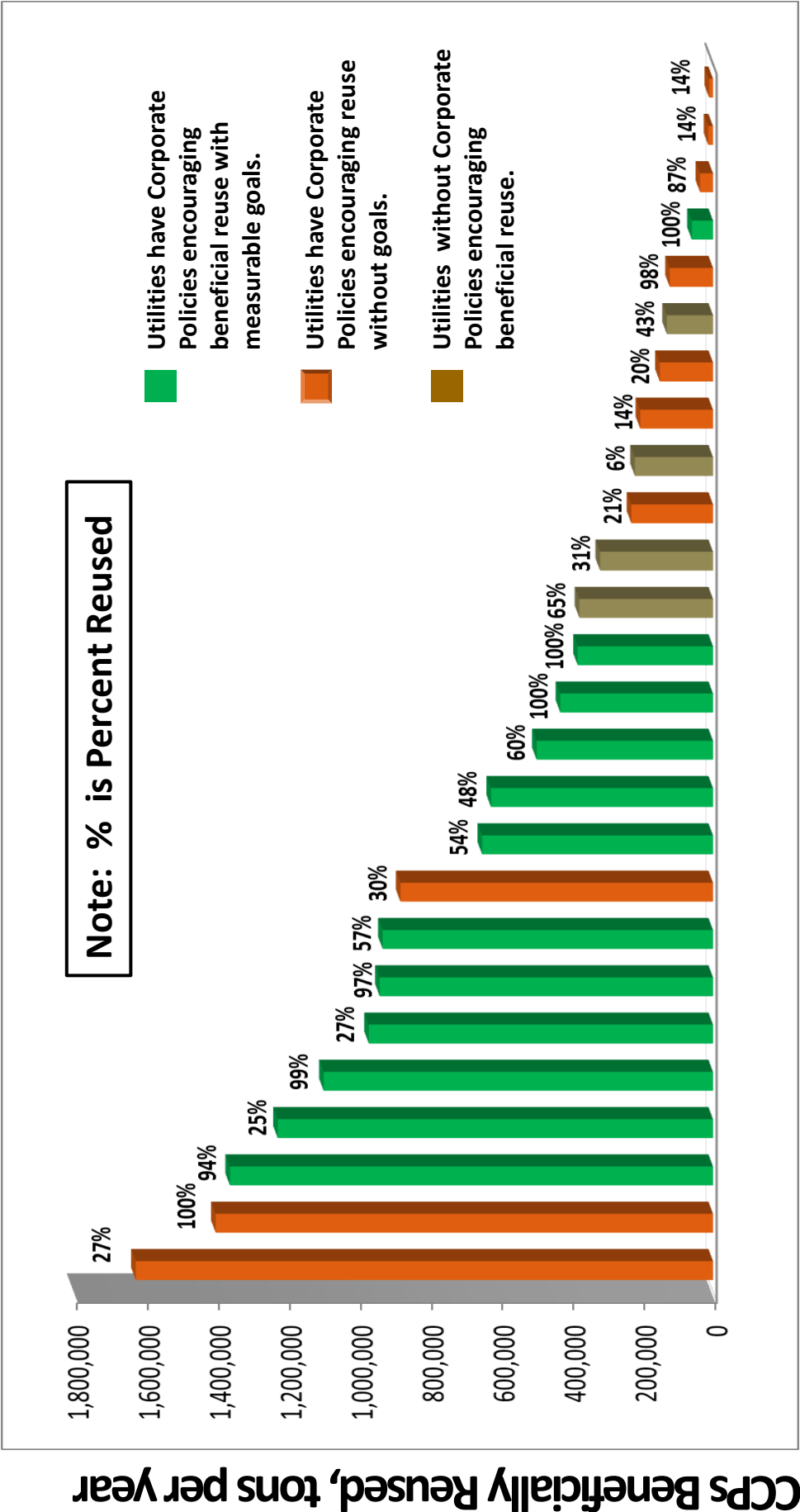
# Reuse Trends & Factors of Small CCP Producers

## OVERALL TRENDS AND FACTORS IN REUSE FOR UTILITIES PRODUCING < 2 MM TONS/YEAR

- Top Reusers have:
  - Specific measurable goals and a corporate policy with a focus on cost avoidance for disposal
  - Marketers that are required to take 100% of CCPs under contract
  - Temporary storage for CCPs
  - Concrete/wallboard plants located at or near power plant
  - Opportunities to co-locate end users at the plant
- Other factors (but not consistent trend amongst the group(s))
  - Beneficiation (3 currently; 1 will start this year)
  - Areas of high population density
  - Proximity to end users
  - Integrated and/or low cost transportation
  - Many respondents competitively bid contracts



# What Impact Does Corporate Policy Have on Beneficial Reuse?



## UTILITY

# What are the Trends Regarding CCP Revenue?

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*We observed the following trends in the Top 12 revenue producers who reported CCP revenue > \$2MM/year:*

- Eleven (11) have corporate reuse policies
- Eight (8) always/often consider corporate reuse policy when making financial decisions related to reuse or disposal
- Eight (8) do not subsidize CCPs
- Three (3) other utilities subsidize by developing relationships with end users
- Three (3) provide capital for storage, terminals or FGD dewatering systems
- 50% established specific measurable goals
- Three (3) have access to rail
- 50% use inside and outside marketers, 50% use outside only

## Ways That Utilities Subsidize the Beneficial Reuse of CCPs

73% of the respondents that reported they subsidize CCP beneficial reuse had reuse rates greater than the top 5 CCP producers.

Methods the surveyed utilities use to subsidize the beneficial reuse of CCPs include:

- Donate fly ash
  - In exchange for concrete in civil projects (sidewalks)
  - To promote CCP use
- Lease land to companies that use fly ash; on property acquired for that purpose



# Ways That Utilities Subsidize the Beneficial Reuse of CCPs

## Methods the surveyed utilities use to subsidize CCP reuse (cont'd):

- Subsidize transportation and loading
  - Load the trucks for free; give material away
  - Pay transportation costs if less expensive than landfilling
  - Use for mine reclamation; pay for transportation
- Provide contractor with power at the plant, use of scales and rail service access
- Invest capital to dewater gypsum; payback compared to avoided operations and maintenance costs or landfill disposal
- Waive revenues for products (gypsum)
- Invest in infrastructure for CCP storage



# Utility Challenges in CCP Beneficial Reuse

During the survey, utilities were asked to summarize their key challenges. The following are their responses.

- Flux in Market and Related Impacts
  - Inconsistency in monthly sales
  - Highs and lows of the construction industry and the economy
  - Reliability of end users
  - Distance to end users and markets
- Regulatory (and Related) Impacts
  - Trying to grow utilization in an environment of increasing regulations
  - New state and uncertain federal regulations
  - Air pollution control technology (compliance strategies) limits ability to market materials
  - Negative public image of CCPs



# Utility Challenges in CCP Beneficial Reuse

## Key challenges of utilities related to CCP Reuse (cont'd):

- Economics
  - Rail and truck transportation costs
- Reliability in CCP Production
  - Maintaining adequate supplies of CCPs due to cycling at plants
  - Long time to get consistent FGD quality
  - Economic impacts due to inconsistent sales
- Corporate/ Internal Items
  - Getting buy-in from management for subsidies/technology
  - Working with power plants and getting cooperation from marketers
  - Time commitment to put deals together





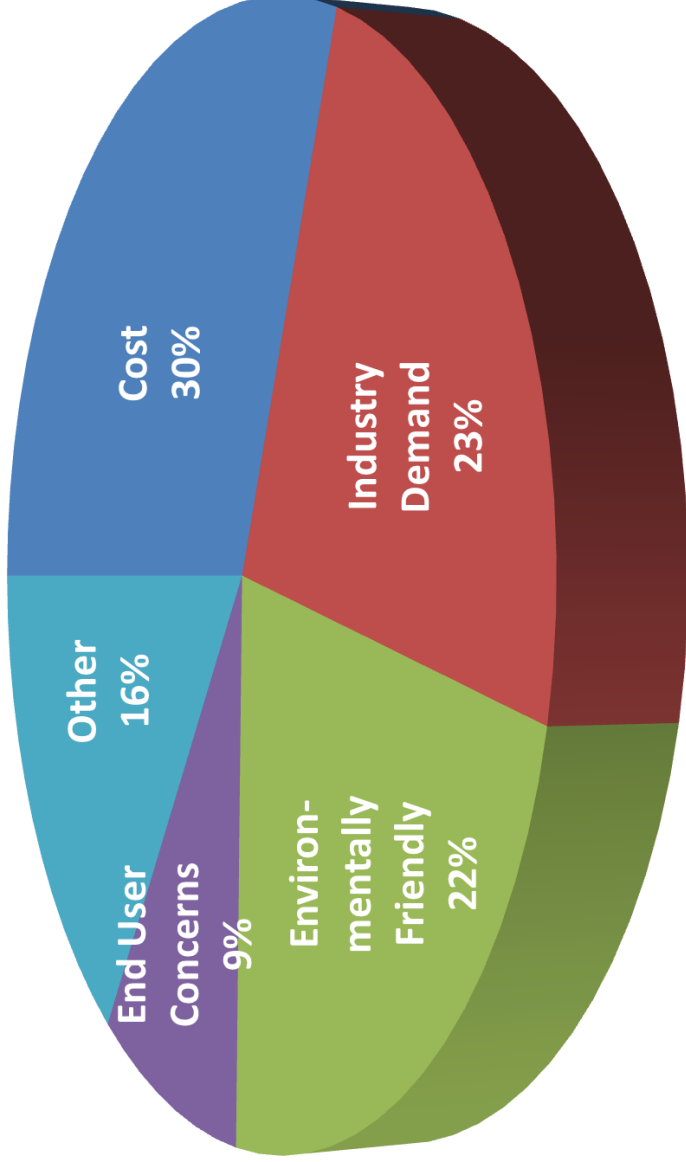
# Trends That Make Marketers Successful

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## FACTORS CONTRIBUTING TO MARKETERS' SUCCESS:

- 91% of the utilities stated that having established markets with end users was important:
  - Investment in infrastructure and storage facilities to support established markets also leads to success of the marketers
- 82% of the utilities reported that having an integrated operation (ability to manage loading, transport and end use under one company) was important
- 87% of the utilities reported that having a regional presence was important
- 55% of the respondents reported that having a national presence was important
- Other key characteristics:
  - Close communications with the plants
  - Good reputation with a solid customer base
  - Ability to provide integrated logistics (one utility signed a long-term contract with a marketer in exchange for capital for rail access)

# Factors Considered in Financial Decisions



Percent of the time that utilities consider various factors when making financial decisions related to CCP reuse and disposal

## **COST:**

- Potential revenue from the sale of CCPs
- Avoid disposal costs (several mentioned this is corporate policy)

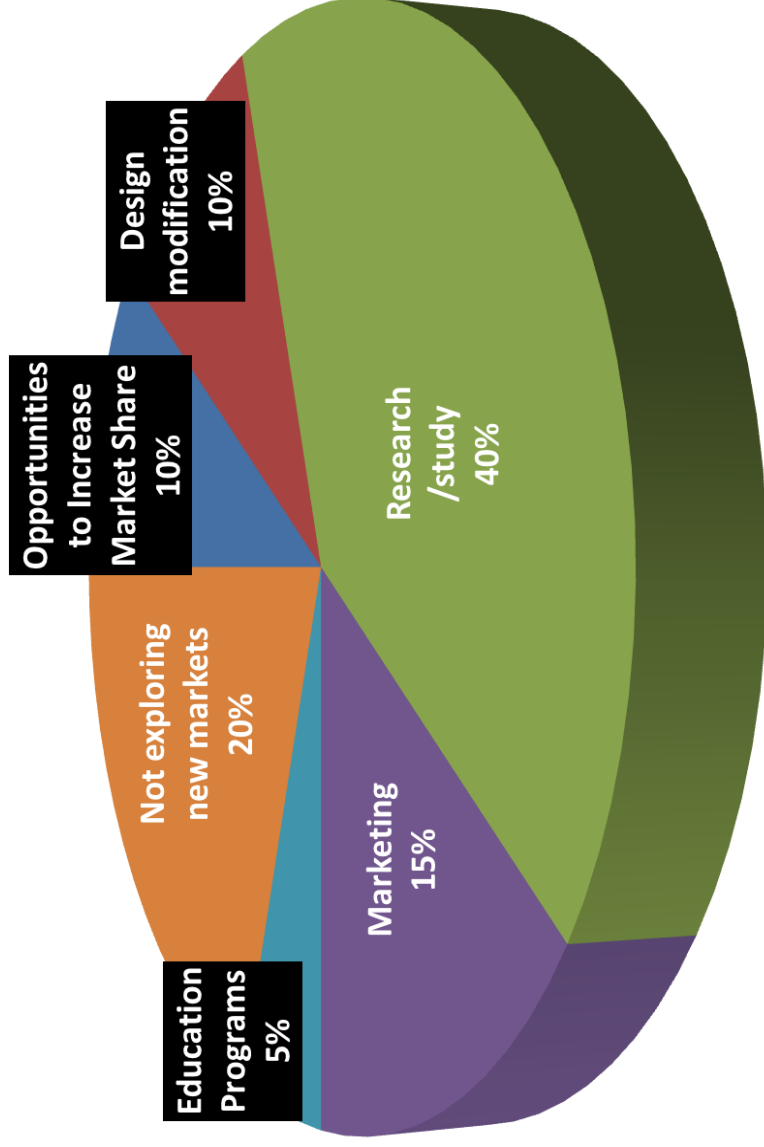
## **INDUSTRY DEMAND:**

- Evaluate the market for structural fill
- Construct infrastructure and storage facilities to meet short term utilization

## **ENVIRONMENTALLY FRIENDLY:**

- Key factor considered
- Concern over use of the material to cause potential environmental liability or environmental safety issues

# Strategies Utilities Use To Improve and Excel in CCP Beneficial Reuse



## Research/Study

- Working with state Departments of Transportation and Universities on use of Fly Ash as structural fill
- Researching use of CCP materials in block, Portland cement aggregate and shingles

## Not Exploring New Markets

- Most products are moved
- Volumes are down
- Not much time to do it

## Marketing

- Reviewing technologies that markets or users need
- Talking to cement and wallboard companies to increase FGD gypsum use
- Expanding terminals for fly ash outside service areas

**Percent of the time that utilities consider various strategies to improve and excel in CCP beneficial reuse**

# Key Benchmark Survey Findings

- Common Factors of Top CCP Producers:
  - Marketers have an established market with end users, a regional presence and integrated operations
  - Both short and long term utilization programs are established
  - Integrated transportation and storage options available to the utilities (barge, rail, silo)
  - Focus on cost avoidance for disposal
  - Locate concrete or wallboard plants at or near the power plant

Overall conclusion:  
Utilities with corporate policies encouraging beneficial reuse with measurable goals have *higher reuse rates*



# Key Benchmark Survey Findings

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- **Utilities face many challenges related to CCP Reuse:**
  - Flux in Markets
  - Reliability and distance to end users
  - Regulatory Impacts
  - Economics of transportation
  - Reliability in CCP production
- **Significant Trends that lead to HIGHER REUSE RATES**
  - Corporate policies that encourage beneficial reuse
    - With measurable goals
    - Considered when making financial decisions related to reuse and disposal
  - Subsidizing beneficial reuse
  - Having established markets with end users
  - Implementation of strategies to improve and excel beneficial reuse



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# Opportunity to Ask Questions

