

# Kentucky Crushed Stone Industry

Is there light at the end of  
the tunnel?

John S L Morgan  
May 17, 2012

# John Morgan - Background

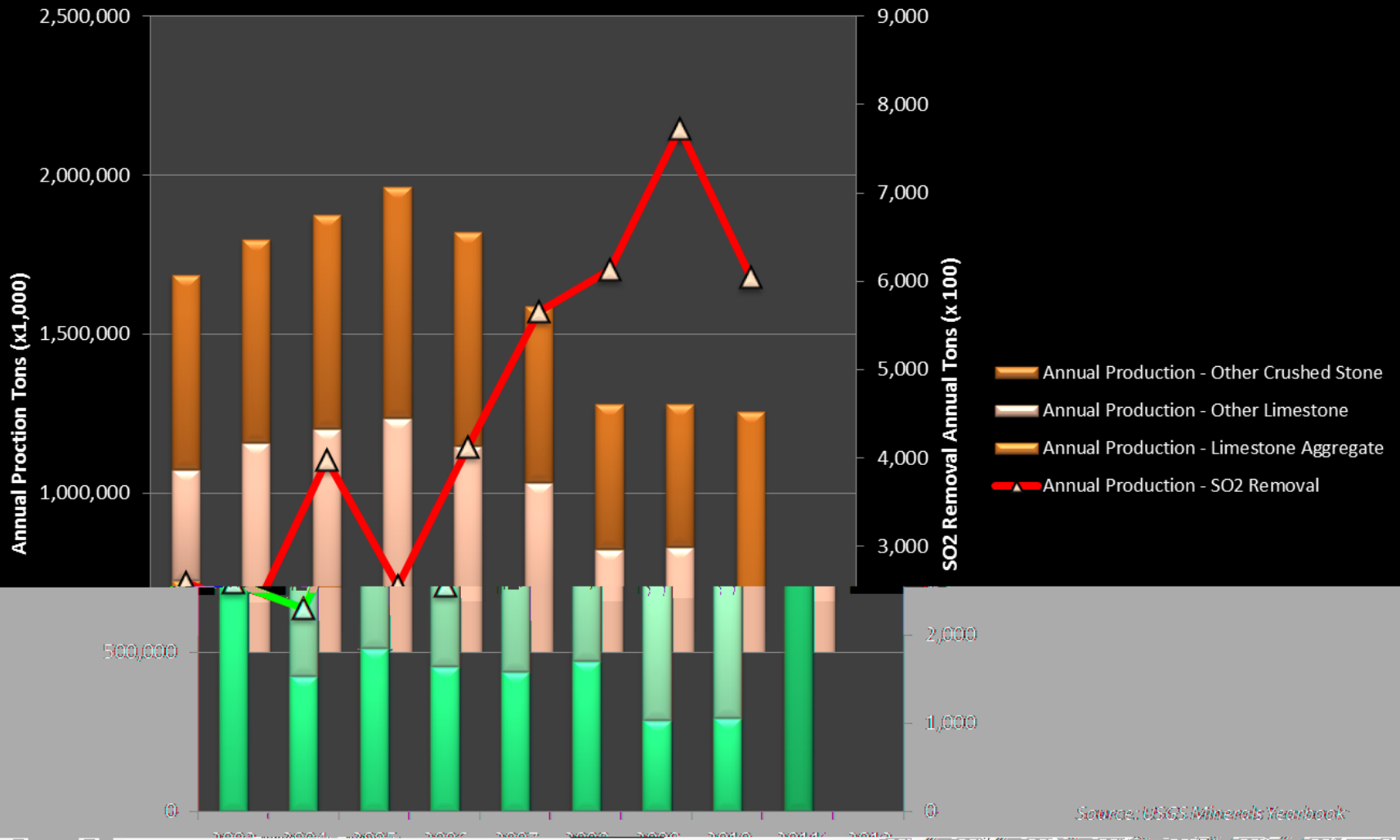


- Degree in Mining Engineering from the Royal School of Mines in London
- Mine planning engineer for coal company in Appalachia
- VP of Operations for an aggregate company since 2005. Responsible for two limestone quarries and one sand and gravel operation. Annual Production of about 5 M tons
- Owned a mining consulting company since 1990
- Consulting assignments worldwide

# US Crushed Stone Industry

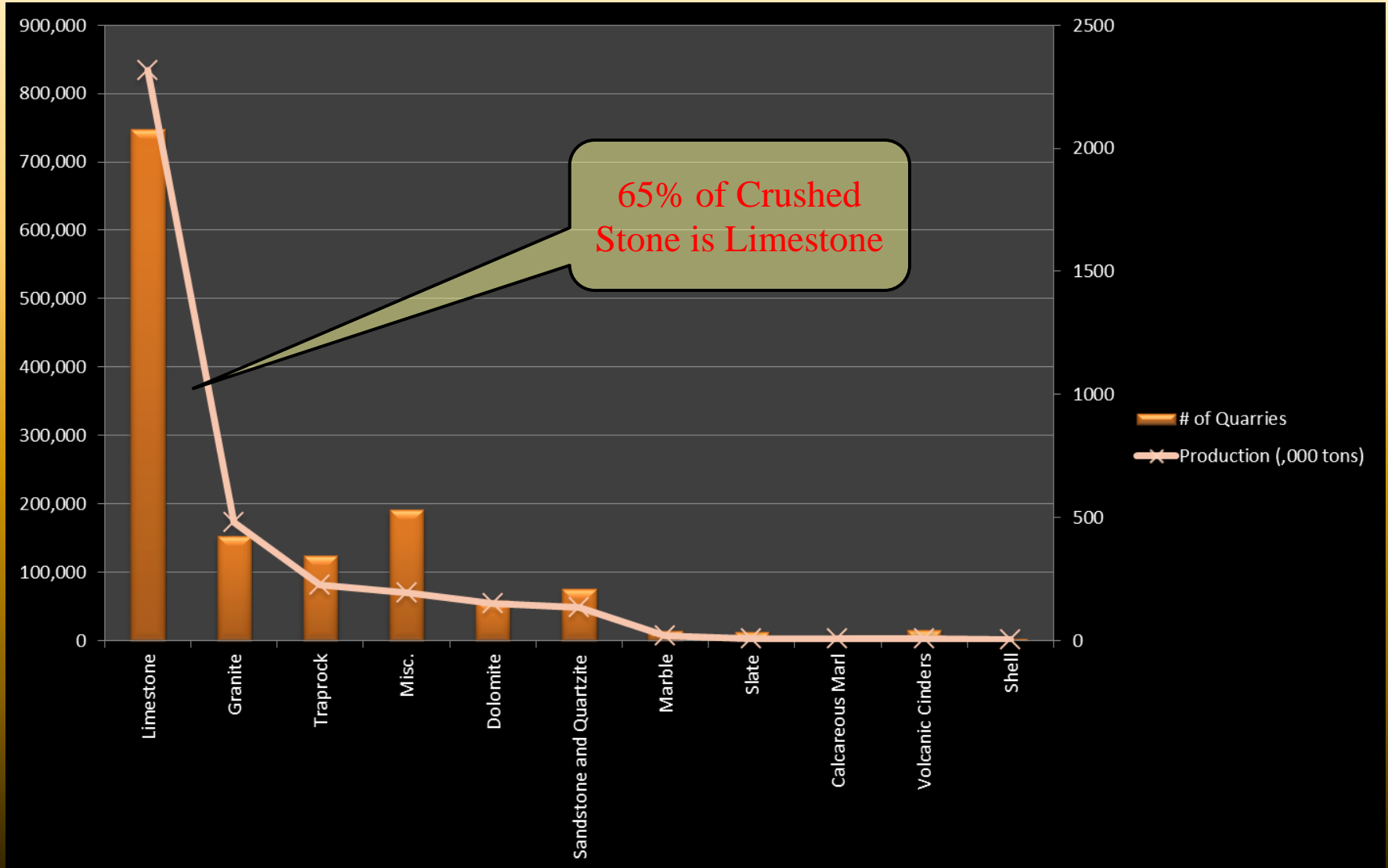


## Crushed Stone - Annual Production Trends



Source: USGS Minerals Yearbook

# US Crushed Stone Industry

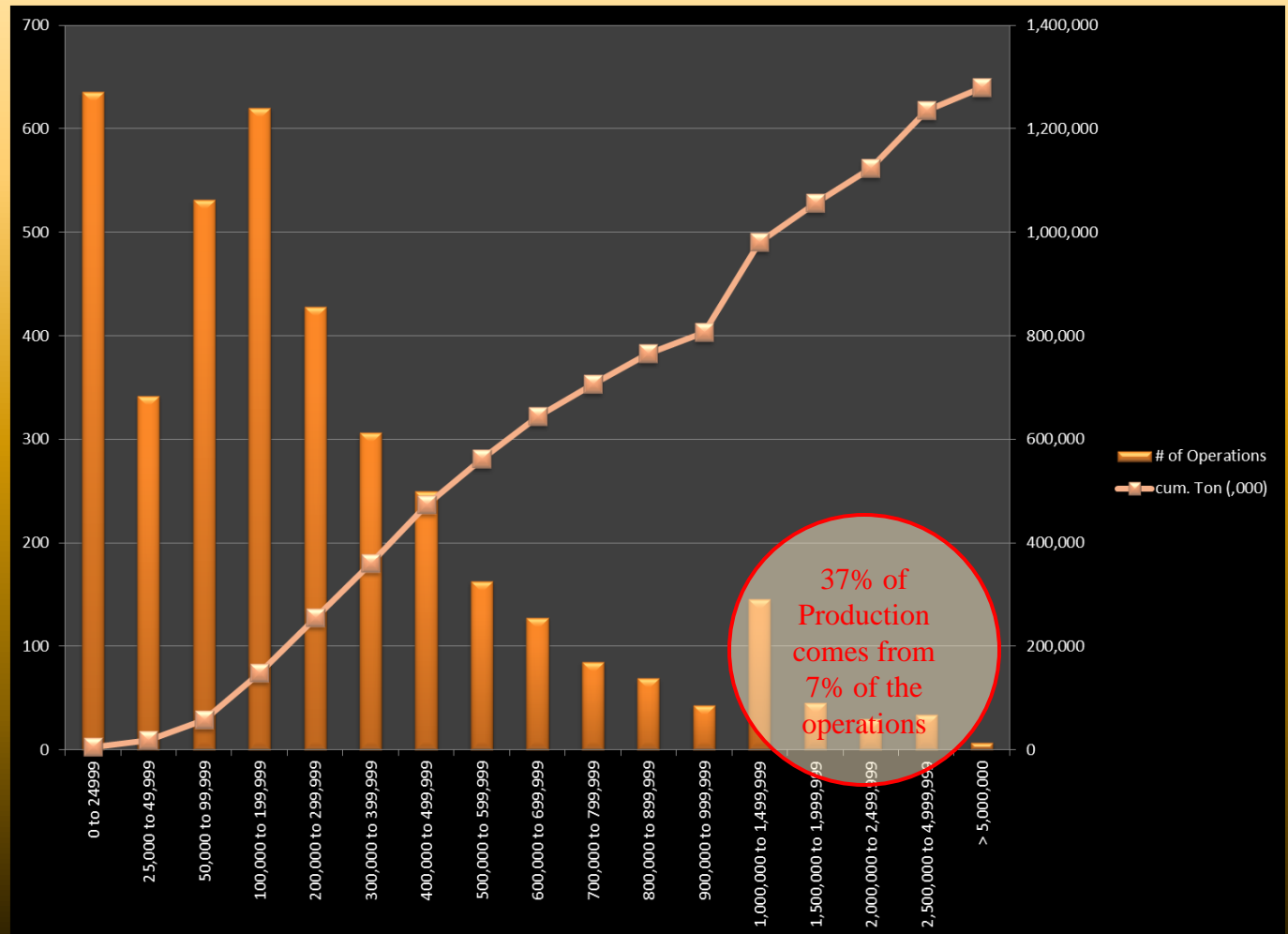


# US Crushed Stone Industry



## ■ Production Distribution for US Crushed Stone Industry

63% of Production comes from the 19% of operations producing more than 0.5 M ton per annum



# US Crushed Stone Industry



- End Use
  - Aggregates
  - Cement
  - Lime
  - Flue Gas Delsulfurization
  - Agricultural

# US Crushed Stone Industry



- Top 10 Producers
  - Vulcan
  - Martin Marietta
  - Lehigh Hanson
  - Oldcastle
  - LaFarge
  - Cemex
  - Carmeuse
  - Rogers
  - Holcim
  - New Enterprise Stone & Lime
- Top 10 produced 619 M tons or 49% of 2010 total
- Top 100 produced 1,007 M tons or 79% of 2010 total
- Ongoing consolidation:
  - Vulcan – Martin Marietta
  - Summit Materials
  - Bluegrass Materials – Acquired Cemex Kentucky Assets in August 2010
  - Vantacore

# Consolidation of US Crushed Stone Industry



- Oldcastle purchase Mountain Materials
- Vantacore purchased Winn Materials



# Consolidation of US Crushed Stone Industry



- Summit Materials

# Consolidation of US Crushed Stone Industry



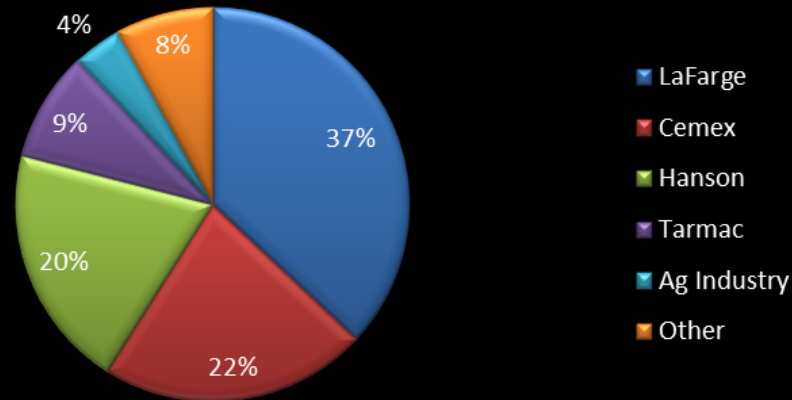
- Bluegrass Materials – Acquired Cemex Kentucky Assets in August 2010



# Industry Consolidation in UK

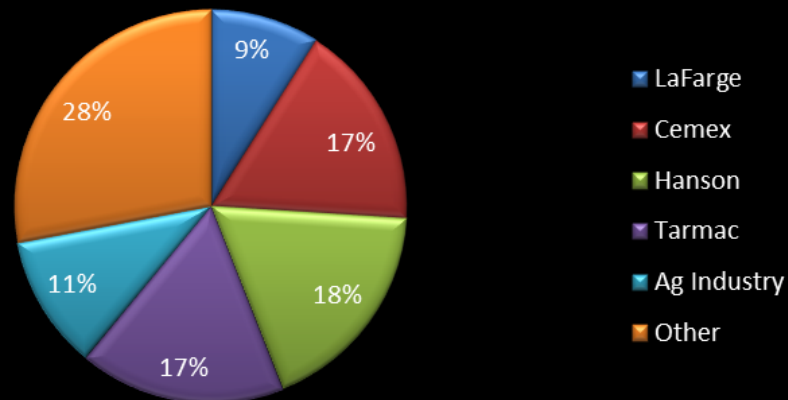


## Cement



**Takeaway:**  
Consolidation in the  
US Industry will  
continue and  
probably accelerate  
in 2013

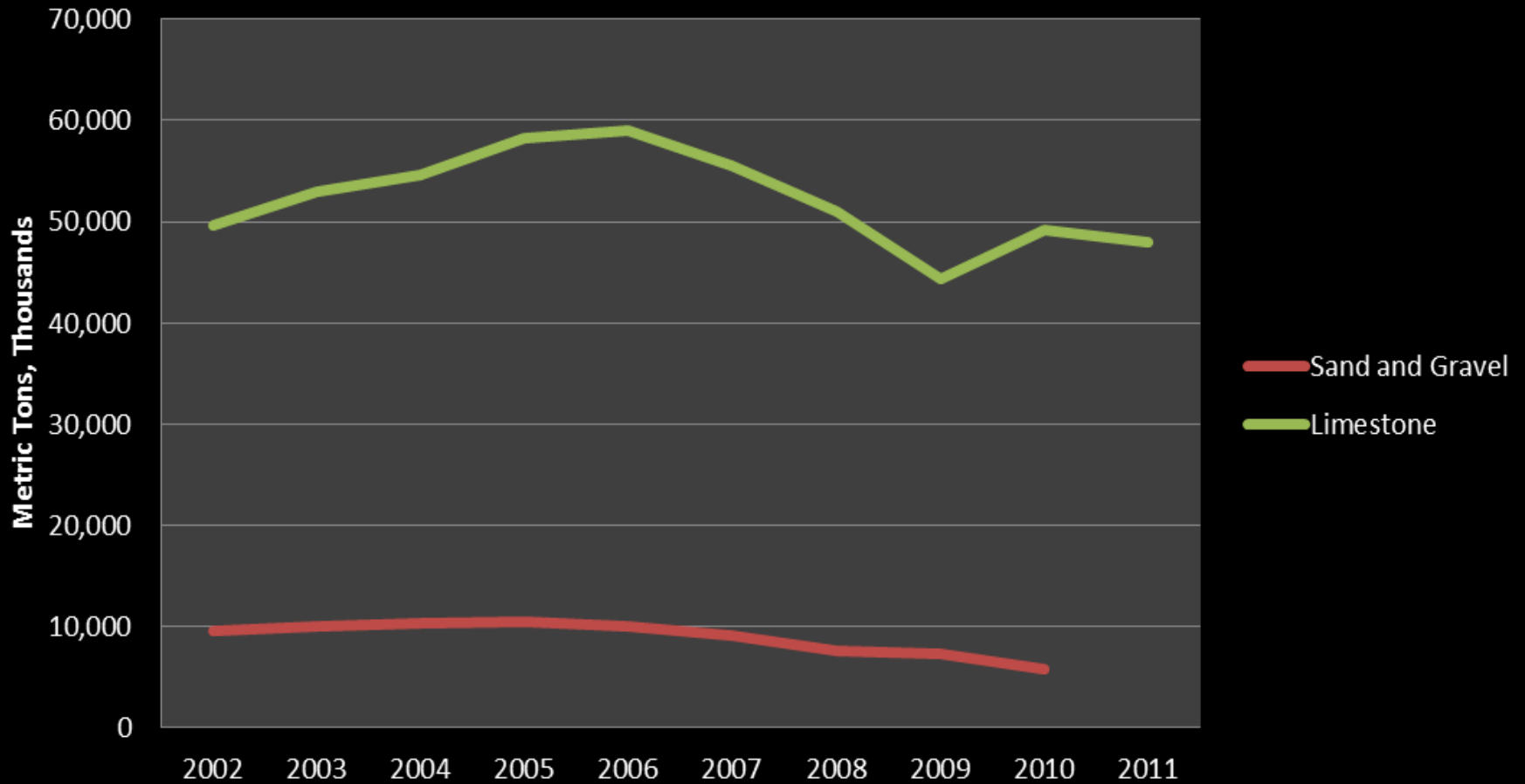
## Ready Mix



# Kentucky Production



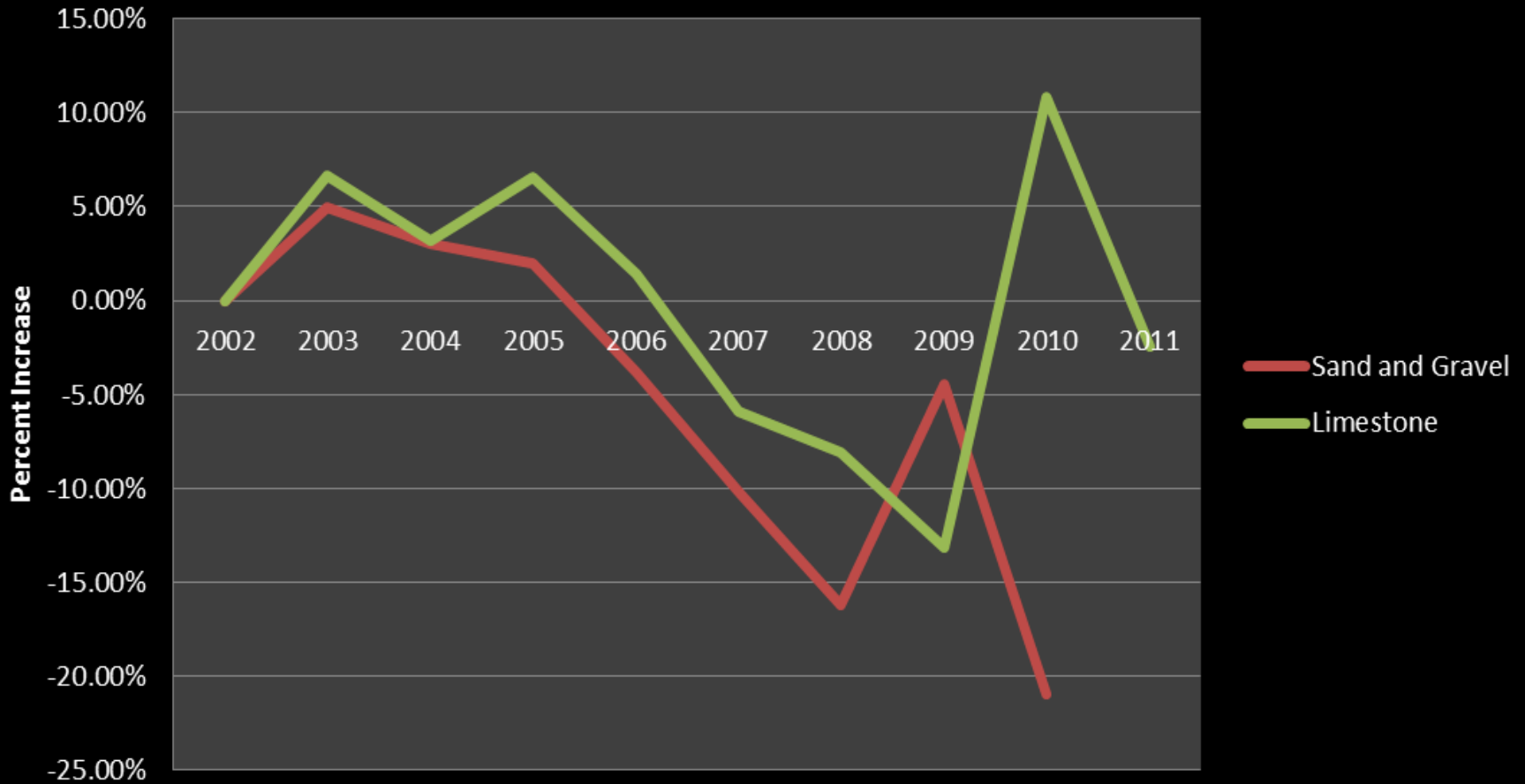
## Kentucky Production



# Kentucky Production



## Kentucky Production



# Each Operation is Different



- Challenge of dipping seams
- Extreme wall heights



# Mine Economics



## Financial Model

### ■ Production

- Tons Mined
- Tons Processed
- Saleable Tons

Difference between  
tons processed and  
tons sold is yield

### ■ Revenue

- Tons Sold
- Selling Price

Difference between  
Saleable Tons and Tons  
Sold is inventory  
change

### ■ Expense

#### ■ Variable

- Labour
- Fuel
- Utilities
- Drilling Supplies
- Blasting
- Royalty
- Severance Tax
- Tyres
- Lubricants
- Fleet Spares
- Plant Repair

#### ■ Fixed

- Salary
- Equipment Lease
- Depreciation
- Taxes

# Mine Economics



## Typical Mine Analysis

| <b>Production</b>                     |                  |
|---------------------------------------|------------------|
| Tons Mined and Processed              | 1,650,000        |
| Overburden / Interburden Tons Removed | 1,150,000        |
| <b>Total Tons Handled in Quarry</b>   | <b>2,800,000</b> |

| <b>Sales</b>         |                  |
|----------------------|------------------|
| <b>Saleable Tons</b> | <b>1,450,000</b> |

Plant Yield is 89%

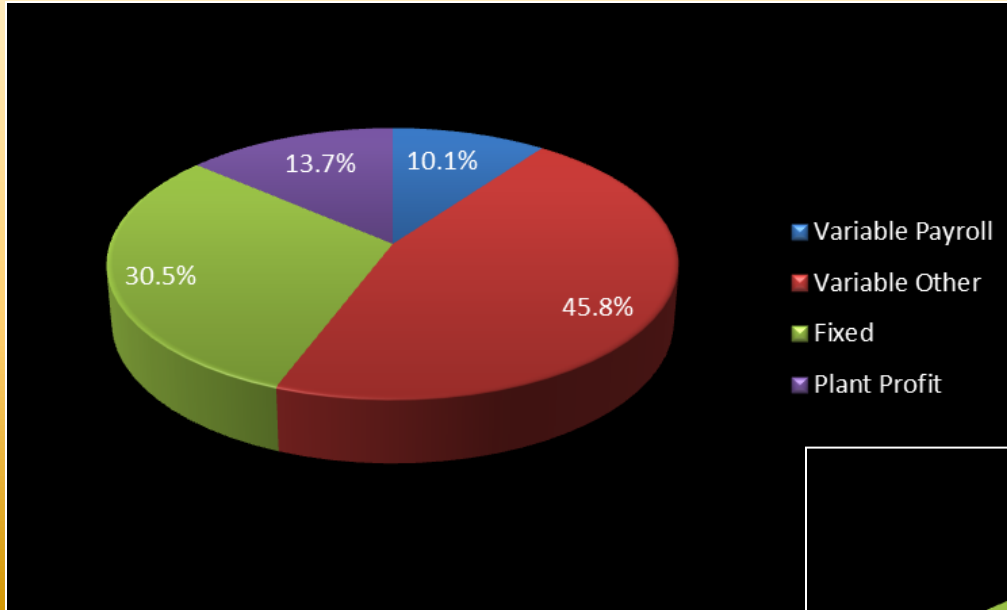
Stripping Ratio is 0.7  
tons of waste per ton of  
Processed Stone



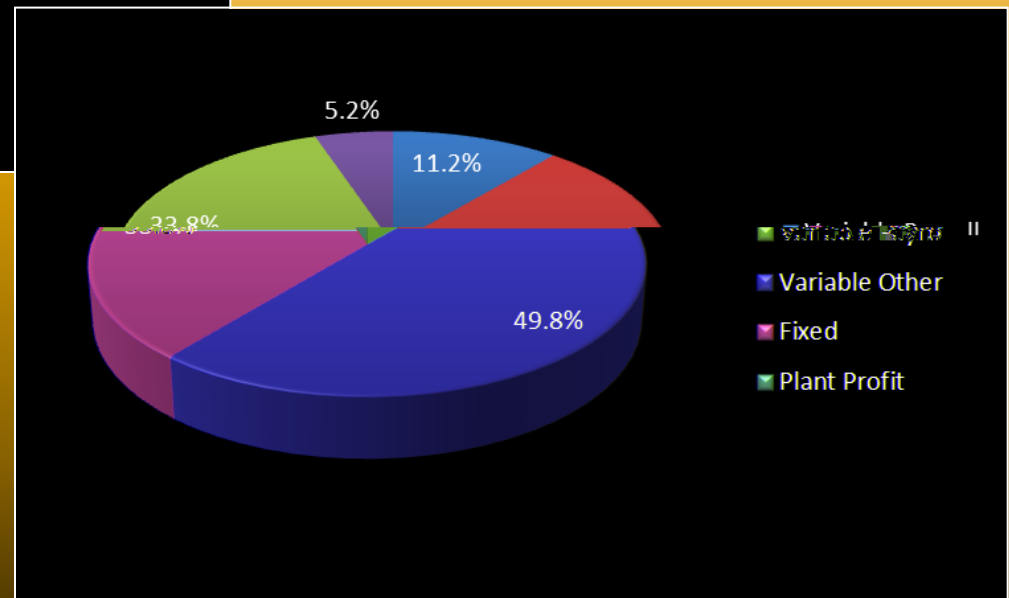
# Mine Economics



## Mine Cost Breakdown



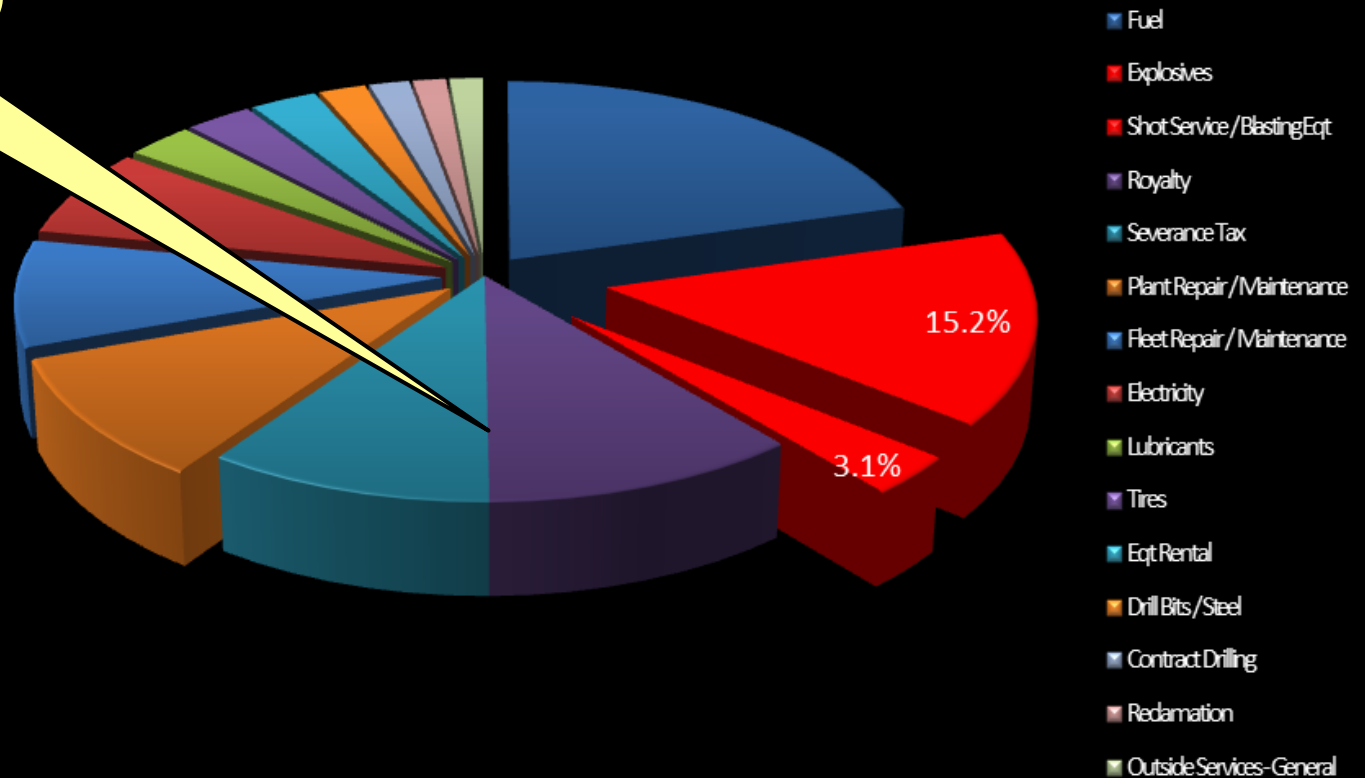
## Effect of 10% decrease in Sales Price



# Mine Economics - Variable



Royalty and  
Severance Taxes are  
fixed % and depend  
on specific Mine

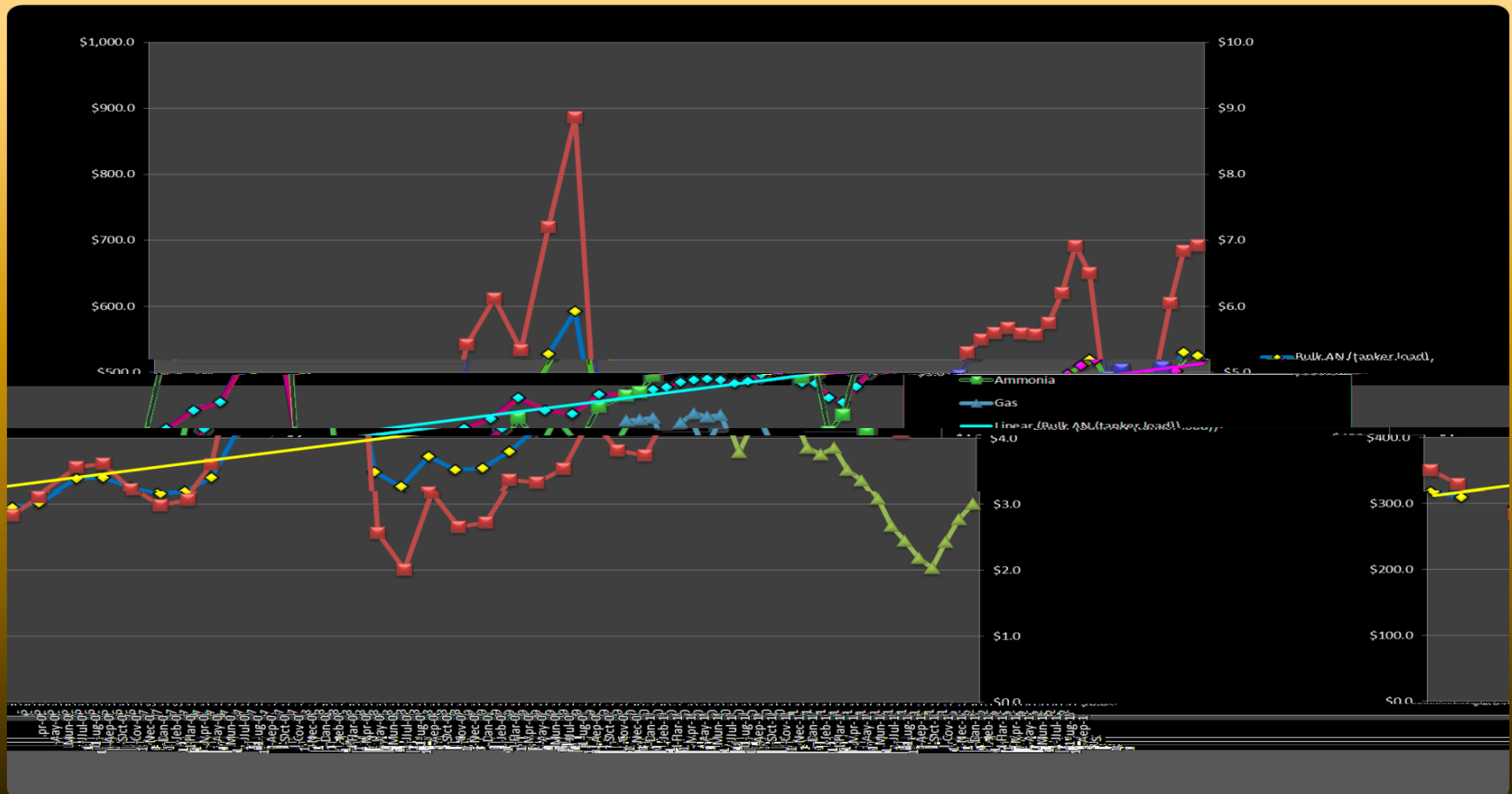


# Mine Economics



## Financial Sensitivity to Input Price Changes

- Historic Changes in AN price
- 8.6% increase in AN price over last 12 months
- Average annual AN price increase over last 5 years of 10%



# Regulatory / Environmental Compliance



## MSHA

- New focus on highwall stability

### **30 CFR 56/57.3200 - Correction of hazardous conditions.**

#### *SCALING AND SUPPORT*

*Ground conditions that create a hazard to persons shall be taken down or supported before other work or travel is permitted in the affected area. Until corrective work is completed, the area shall be posted with a warning against entry and, when left unattended, a barrier shall be installed to impede unauthorized entry.*

### **30 CFR 56/57.3130 - Wall, bank, and slope stability.**

#### *MINING METHODS*

*Mining methods shall be used that will maintain wall, bank, and slope stability in places where persons work or travel in performing their assigned tasks. When benching is necessary, the width and height shall be based on the type of equipment used for cleaning of benches or for scaling of walls, banks, and slopes.*

### **30 CFR 56/57.3201 - Location for performing scaling.**

*Scaling shall be performed from a location which will not expose persons to injury from falling material, or other protection from falling material shall be provided.*

# Regulatory / Environmental Compliance



# Regulatory / Environmental Compliance



MSHA Guidance is that:

*“barrier placed 25% of the height of the highwall, from the base of the wall to the inside edge of the barrier, to provide sufficient protection..”*

*“..provide a sufficient ground control plan..”*

Actions:

- Work with operator to design MSHA compliant ground control
- Increased use of pre-split
- Design pre-split to reduce cap rock overhang



# Regulatory / Environmental Compliance



## Blasting Impacts

- Vibration
  - Scale distance is not adequate
  - Identify critical structures
  - Site Specific criteria
- Air Blast
- Fly Rock

# Permitting



## Mine Permits

- Issued by State agency
- Defined format and performance standards

## Zoning

- Major Issue due to land use conflicts:
  - Noise
  - Dust
  - Vibration
  - Traffic
  - Light
  - Viewshed



# Permitting



Trends due to Permitting:

- More remote mining locations
- Underground Mining



**Hannibal, MO**

**Verona, KY**



**Wampum, PA**

**Joliet, IL**

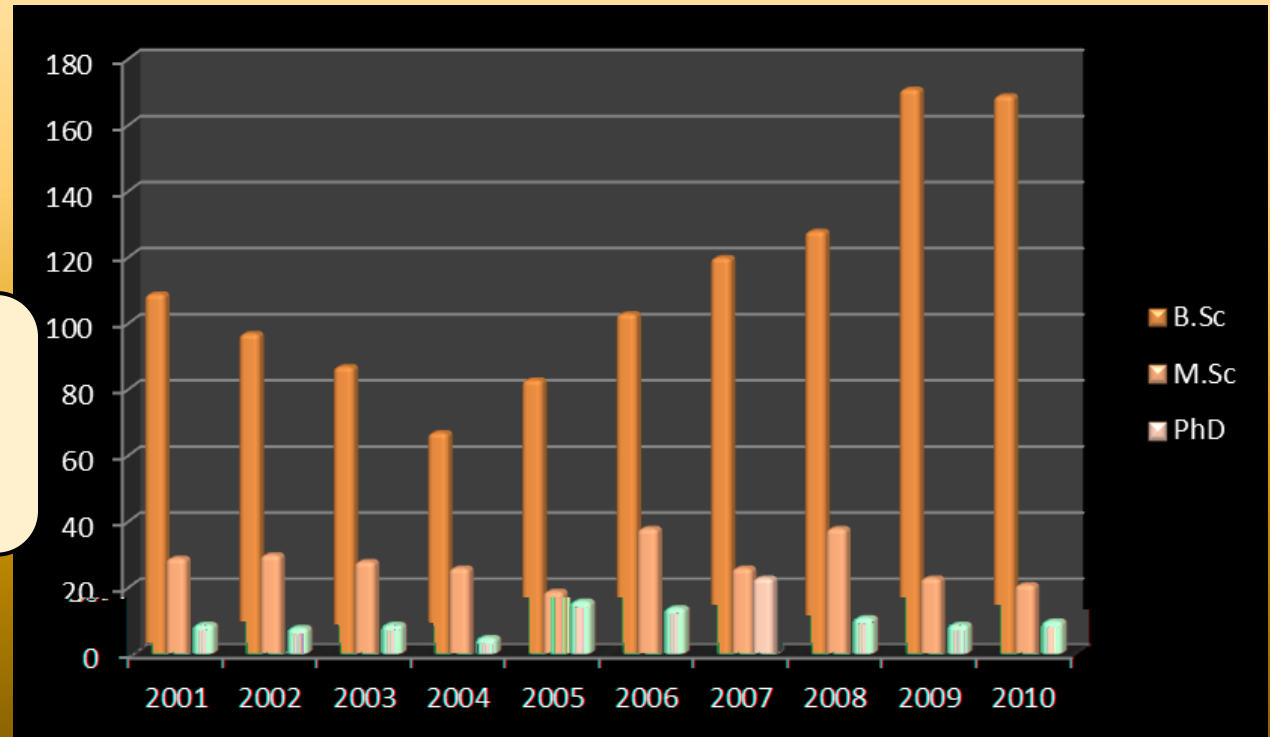
# Understanding your Customer



## Changes in the Characteristics of the Industry

- Shortages of Engineers

**Takeaway:**  
Industry will increase  
outsourcing



- Aging of the workforce
- Ability of hourly employees to meet pre-employment requirements