

Start Here

A recognized leader in mine safety and environmental compliance, St. Louis-based Arch Coal, Inc. (NYSE: ACI) is one of the world's largest and most efficient coal producers, with more than 160 million tons sold in 2010. Through 11 mining complexes in six states, we represent roughly 15 percent of America's coal supply. Our national scope of operations and 4.4-billion-ton reserve base includes a presence in five of six major U.S. coal supply basins. Our core business is supplying cleaner-burning, low-sulfur coal to customers on four continents, including U.S. and international power producers, industrial and other end users as well as steel manufacturers.

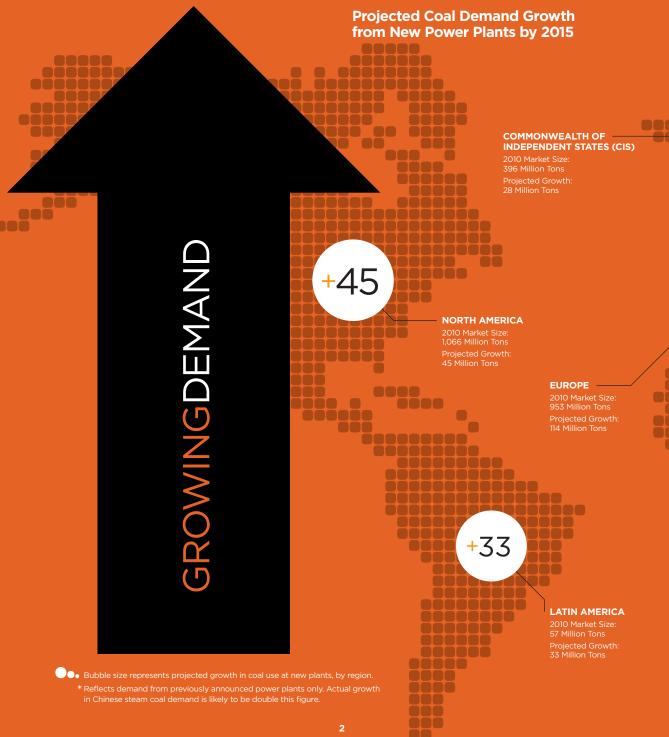
It's the start of a new decade, and coal's story is as compelling as ever. Coal is the rock upon which the developed world's economies were built - and it will continue to play a dominant role in powering the residential, commercial and manufacturing sectors of these economies for decades to come.

In emerging markets, coal is the lifeblood supporting economic growth. It's an essential input for steel making, an energy feedstock for industry and agriculture, and an abundant and affordable power source for electric grids around the world. Coal is playing a pivotal role in alleviating poverty, building the wealth of nations and advancing the quality of life for the world's citizens.

But coal's story is also defined by its struggle to keep pace with demand. Many of the world's traditional supply regions are facing reserve depletion, regulatory pressures and inadequate infrastructure investment. Overcoming these challenges – and bringing on new supply – will require long lead times and a massive capital outlay. These forces drive coal prices today ... and will continue to influence coal markets in the decade ahead.

Coal Is the World's Energy

Global coal consumption reached nearly 8 billion tons in 2010, having expanded by a record 3 billion tons in the past decade. China alone boosted its coal consumption from 1.3 billion tons in 2000 to 3.5 billion tons in 2010. Given current rates, global coal use could well increase another 3 billion tons in the next decade. In fact, by 2015, the world currently plans to add at least another 1.4 billion tons to annual coal demand.



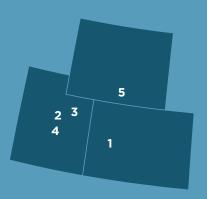
Coal-fueled plants are being built around the globe as the world's population increases and emerging nations expand and electrify their cities. A total of 425 gigawatts of new coal-based generating capacity is slated to come online by mid-decade, adding the equivalent of current U.S. coal industry production and more to global coal consumption.

Beyond coal-based power plant additions, expected growth in per-capita steel consumption in developing economies will drive up demand for metallurgical coal in the coming years. Moreover, the adoption of plug-in electric vehicles in developed countries could accelerate the pull for steam coal in particular.



Strategic, Domestic Reserve Base

Arch Coal's reserves stretch nearly coast-to-coast, allowing us to meet future coal demand inside and outside America's borders. Our coal shipments are regionally balanced across the nation's four major railroads, while our investments in river terminals in Kentucky and Illinois grant us flexibility to transport coal on the nation's inland waterways. In addition, our equity investments in marine terminals on the East and West Coast – along with throughput opportunities at ports in Virginia, Louisiana, California and British Columbia, Canada – provide access to the growing seaborne metallurgical and steam coal trade.



455

16

WESTERN BITUMINOUS

Arch is the largest coal producer in the Western Bituminous Region, comprised of Utah, Colorado and southern Wyoming.

- 1. West Elk
- 2. Skvline
- 3. Dugout Canyor
- 4. Sufcc
- 5. Arch of Wyoming



1,353

NORTHERN POWDER RIVER BASIN

During the past two years, Arch has amassed 1.4 billion tons of coal reserves in this developing basin, and now controls more reserves than any other coal producer there.

1. Otter Creek reserves

4,445
million tons of strategic coal reserves held by Arch Coal

1,905
million tons of reserves

132
million tons sold



SOUTHERN POWDER RIVER BASIN

With the addition of Jacobs Ranch in 2009, Arch now stands as the largest producer of 8800-Btu coal and the second largest producer overall in the region.

- 1. Black Thunder
- 2. Coal Creek

Each dot represents 50 million tons of reserves at 12/31/2010.

^{*} Represents sales volumes related to Arch's equity interest in Knight Hawk

U.S. coal production continues to shift westward, and Arch has invested heavily in western coalfields to expand its superior operating position there. Over the past 13 years, the Powder River Basin has become the nation's largest coal supply region, serving 48% of U.S. steam coal demand. Also, the Western Bituminous Region (representing 6% of U.S. steam coal output) is a key supply source for the Rocky Mountain area. which boasts the nation's fastest-growing population. Additionally, both regions can further extend their reach into eastern U.S. states and globally.

Arch also maintains a presence in key eastern coalfields. Although the nation's No. 2 coal supply basin, Central Appalachia, is in secular decline - faced with depleting reserves and significant regulatory hurdles - it remains a strategic steam coal supply source for domestic and European power generators, and represents an important metallurgical coal supply source for global steel manufacturers. In addition, the Illinois Basin stands poised for resurgence as global steam coal demand rises and growth in world coal supply remains constrained.



million tons sold

ILLINOIS BASIN

With a 49% equity interest in a private coal producer and a large, undeveloped reserve base in this basin, Arch has varied expansion opportunities it can pursue.

1. Knight Hawk (equity interest)





CENTRAL APPALACHIA

Arch maintains a sizeable, focused and low-cost operating position in the region, with flexibility to service both the metallurgical and steam

- 2. Coal-Mac
- 3. Cumberland River

SHIFTINGWESTWARD

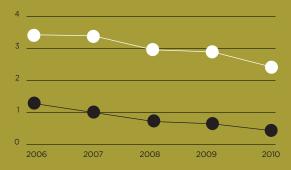
Safety and Stewardship Add Shareholder Value

An industry leader in safety and environmental performance, Arch Coal continues to set the bar higher each year. In 2010, we set a new record for safety, attaining a lost-time incident rate of 0.46, the best in our history and the best among diversified U.S. coal industry peers. Last year, we also delivered our best environmental performance on record (as measured by SMCRA* violations). Achieving success in our core values of safety and environmental performance is absolutely critical for the overall success of our company. Of course, our ultimate goal is the "Perfect Zero" – zero injuries and zero environmental violations at each operation each and every year.



SAFETY RECORD (LOST-TIME INCIDENT RATES)

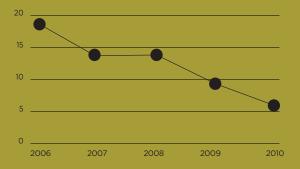
(per 200,000 employee-hours worked)



- U.S. Coal Industry Five-Year Average 3.03
- Arch Coal Five-Year Average 0.85

ARCH'S ENVIRONMENTAL COMPLIANCE RECORD

(number of SMCRA* violations)



* Surface Mine Control and Reclamation Ac

With the continued application of technology, the U.S. power generation industry succeeded in reducing plant emissions by 67% from 1970 to 2009 – even as coal use climbed 150%. As more funds flow into clean energy programs, technology can and will deliver solutions to reduce greenhouse gas emissions, too. Given the rapidly expanding use of fossil fuels around the world, it's imperative that investment in such technologies – like carbon capture and storage – increase.

University of Wyoming's School of Energy ResourcesU.S. Department of Energy's National Carbon Capture Center

Arch supports clean coal technologies as part of our core values. We're investing in a project that can turn coal into gasoline, with plans to capture the CO₂ emissions from the proposed plant for use in enhanced oil recovery at domestic oil fields. We're also financing and licensing technology aimed at reducing mercury emissions from coal. And, we're mining and marketing predominantly low-sulfur coal to help limit traditional emissions at power plants.



Cash Is King at Arch Coal

2010 was a good year for coal stocks, and particularly for Arch Coal, as our share price rose 58% compared with a gain of 13% for the S&P 500. Our company delivered record free cash flow last year – a winning combination of improved earnings performance and restrained capital spending. Arch also achieved its second highest EBITDA in company history, driven by substantially higher operating margins in each region. More importantly, we expect 2011 to be even better.



^{*} Defined and reconciled at the end of this report.

In 2010, Arch shored up its already strong balance sheet, reducing its net debt outstanding to \$1.5 billion at year-end. The nearly \$200 million spent on debt reduction last year helped the company lower its net-debt-to-capital ratio to 40%. Beyond building our balance sheet strength, we successfully completed a \$500 million bond offering that extended a portion of our debt maturities out by seven years, from 2013 to 2020, providing additional financial flexibility.

Arch is exceptionally well positioned in the U.S. coal industry with its delevered balance sheet and minimal level of legacy liabilities. As always, we'll pursue organic growth opportunities that enhance our return on capital and evaluate strategic growth investments that create shareholder value – but we will do so prudently, as we've demonstrated over the course of our history. Absent those opportunities, we will look for ways to return our free cash flow to shareholders.

\$3,186

million in reported revenues in 2010 marking the best year in company history.

2008

\$182

2009

\$60

2010

\$382

NET-DEBT-TO-CAPITAL RATIO

(percent of total capital)

2000

2010

84%

40%

ADJUSTED EBITDA*

(in millions

2000

2010

\$315

\$724

Dear Fellow Shareholders:

The past decade has certainly been good financially for the U.S. coal industry and for coal stocks. Since 2000, an investment in ACI has returned 453% compared with a return of 15% for the S&P 500, highlighting our shareholder focus and five dividend increases during the past 10 years. Of course, other drivers contributed to this outperformance, including supply constraints, global economic growth and industrial expansion in emerging nations. So what will drive coal markets in the decade ahead? We believe it will be more of the same.

Developed countries are finally rebounding from the Great Recession of 2009, while the developing world continues its rapid pace of economic growth, infrastructure spending and energy use. Coal industry consolidation, supply rationalization and reserve depletion will further shape future coal market dynamics. It's still early in this global commodity super-cycle. We urge you to **Start Here.** It will be an exciting journey.



Building Strength

During the past decade, we have been busy building our asset base – either through organic growth initiatives or via opportunistic strategic additions. We've also pruned our portfolio along the way by monetizing non-core operations and reserves. All of these efforts have transformed Arch Coal into what it is today – a world-class energy company and the operator of some of the safest and most environmentally responsible mines in the world.

In particular, we've assembled strengths in four areas that will propel our success in the next decade. First and foremost, our safety performance is unparalleled in the U.S. coal industry. The tragic events of the past year in the coal industry serve as a reminder of the importance of mine safety. In 2010, nearly half of our mines and facilities worked an entire year without a single reportable injury. With our dedicated safety culture and our adoption of progressive practices such as behaviorbased safety, we remain focused on continuous improvement in this critical area of performance.

Arch was also honored in 2010 with a national Sentinels of Safety certificate from the U.S. Department of Labor, as well as eight state awards for outstanding safety practices. In February 2011, the company's flagship operation, Black Thunder, surpassed 8 million employee hours – or more than two years – without a lost-time incident.

Second, and in tandem with a commitment to safety, our environmental compliance record is vital for measuring success as an organization. In 2010, Arch delivered its best year on record for environmental compliance, continuing to lead other major coal industry peers. Our mines excelled in environmental stewardship practices

last year, earning seven national or state awards, including the U.S. Department of Interior's National Award and the Interstate Mining Compact Commission's National Public Outreach Award.

Third, the most successful companies in commodity businesses tend to be low-cost producers. We never lose sight of that goal, and our mines consistently vie for that honor in each of our primary producing regions. Our reported costs per ton in 2010 reflect this success. In particular, costs in the Powder River Basin took a step down in 2010 as the full integration of Jacobs Ranch into Black Thunder - the world's largest coal mining complex - was realized. Operating costs in the Western Bituminous Region also improved in 2010. Central Appalachian costs increased only marginally last year, due almost exclusively to higher sales-sensitive costs. Moreover, we continue to maintain one of the lowest-cost operating structures in that region.

Arch's operations also attained major milestones in productivity during 2010, helping to enhance our cost performance. Our surface and underground mines again achieved productivity levels that far outranked U.S. coal industry averages, highlighting our significant scale advantage in production. Moreover, all of our longwall operations placed among the nation's top 20 most productive underground operations.

Fourth and finally, we believe financial strength is a key contributor to success in the commodity space. In fact, our financial performance has improved steadily since the downturn in 2009 ... and should accelerate in the coming years. In 2010, Arch set new records for revenues and cash flow. Improved margins in each of our operating regions helped to expand our profitability, allowing us to achieve our second highest level

Coal's Compelling Story

An abundant, affordable and vital national resource, coal should be the starting block for America's energy policy.

FOSSIL FUEL PRICES

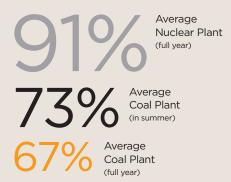
(prompt delivery, \$ per million Btu, at February 25, 2011)



Coal commands a significant cost advantage over other fossil fuels for power generation.

AVERAGE UTILIZATION AT SELECT U.S. POWER PLANTS IN 2010

(percent of total capacity used)



Even during peak seasons, coal plants continue to operate at relatively low capacity factors. Improving utilization at these plants can increase coal demand considerably.

PROJECTED GROWTH IN U.S. COAL CONSUMPTION

(in millions of tons)

1051

2030

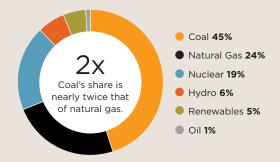
2010

1,240

Domestic coal use is projected to climb 18 percent by 2030. That kind of steady growth - coupled with a promising export story - should create significant opportunities for value creation.

COAL'S SHARE OF THE U.S. ELECTRICITY MARKET

(in 2010, through November)

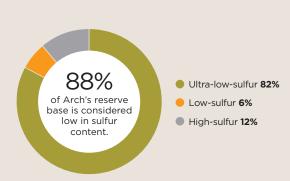


Coal plays a dominant role in powering America's electric grid, keeping energy costs low for consumers and making U.S. businesses more competitive.

Arch Coal's Compelling Story

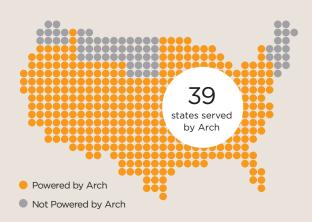
Arch is geared up and ready to deliver even better financial results, to generate increasing returns above our cost of capital and to re-deploy our free cash flow in ways that benefit our shareholders. **Start Here** to join us.

ARCH'S RESERVE BASE BY SULFUR CONTENT



Roughly 88% of Arch's reserve base is low in sulfur, helping generators limit emissions and meet government regulations without the need for additional capital outlay.

U.S. STATES SERVED BY ARCH COAL



In 2010, Arch served 195 power plants and other end users in 39 of the 48 continential U.S. states, and customers on four continents.

ARCH'S MINES: PRODUCTIVE AND PROFITABLE

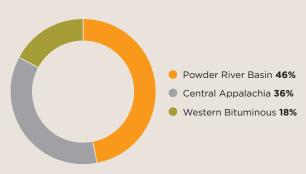
(2010, tons per employee-hour)



Arch's surface and underground mines achieved productivity levels that far outpaced U.S. coal industry averages in 2010, highlighting our significant scale advantage in production.

EARNINGS DIVERSITY - ARCH COAL

(2010, segment EBITDA by region)



While the company's production is weighted toward the Powder River Basin, Arch's financial results are well balanced across all operating regions.

of EBITDA in company history. We also exercised restraint in capital spending, and used the record free cash flow generated to reduce our debt levels, further enhancing our liquidity position. Furthermore, we continued to protect and bolster our balance sheet, which boasts the industry's lowest level of legacy liabilities.

Overcoming Weakness

We also overcame several challenges in 2010. On the market front, coal stockpiles at U.S. power producers began the year at record levels, and fears of a double-dip U.S. recession lingered throughout the summer. However, favorable weather trends in 2010, along with a nearly 3% rise in the nation's GDP, helped to cut those stockpiles by 33 millions tons from the record high level reached at the end of November 2009. In 2011, we are projecting another reduction of 25 million tons – assuming supply and demand remain relatively flat – which would result in stockpiles falling to their lowest levels in nearly five years.

In addition, natural gas prices languished for the second straight year, creating a further drag on coal markets. Fortunately, the ability for natural gas to displace coal remains relatively modest. We believe that existing generation and transmission constraints limit the amount of coal that can be displaced by gas to less than 5% of overall consumption. Moreover, even at today's seemingly unsustainable natural gas prices, most U.S. coal basins – and particularly the Powder River Basin – still command a significant cost advantage for power generation.

Seizing Opportunity

We foresee considerable market opportunities developing in global and domestic coal markets. In the next five years alone, the world will need to replicate current U.S. coal industry production and more to meet projected demand.

Since much of the planned coal development is projected for the Asia-Pacific region, Arch acquired a 38% interest in the MBT marine terminal in Washington state that is seeking to facilitate exports of domestic coal off the West Coast. We have also secured throughput capacity out to 2015 at Ridley Terminal in British Columbia, Canada, and are exploring other opportunities to increase coal exports off the West Coast. These options will help us to meet our strategic objective of expanding coal sales from the Powder River Basin and the Western Bituminous Region into the world's largest and fastestgrowing coal market. These developments increase our direct exposure to the seaborne thermal market and should further unlock the value inherent in our western coal assets.

Moreover, we will continue to capture export opportunities for our Central Appalachian coal assets, as well as our growing Illinois Basin interest. Our equity stake in the DTA marine terminal in Virginia – along with throughput options at other East Coast facilities and investments in inland river terminals – will allow Arch to increase its exposure to the Atlantic Basin metallurgical and thermal coal trade. Our trading function further supports our strategy of increasing participation in international coal markets.

Turning to domestic markets, growth in coal demand will be fueled by higher utilization at existing coal plants and usage at new coal plants recently completed or well underway. In total, we project 45 million tons of incremental, annual coal demand from new coal plants during the next four years, and another 90 million tons

of new, annual coal consumption from higher utilization (from 67% to 73%) at existing plants.

At the same time, we expect that coal supply in Central Appalachia will continue to decline, with up to 40 million tons of regional supply disappearing by mid-decade. This decline represents another market opportunity for other coal basins, particularly the Powder River Basin, to step in and fill the domestic coal supply gap.

Confronting Threats

Of course, ongoing regulatory and permitting pressure will likely result in the retirement of some older, less efficient coal plants. We expect these potential closures to be modest, and ultimately dependent upon the future power needs and the economic conditions of those communities served by the plants in question. In addition, new sources of coal demand could offset the aggregate coal demand lost from any proposed coal plant closures.

Furthermore, regulatory challenges will continue to dynamically change the U.S. coal industry. We expect more high-cost coal supply rationalization and perhaps even further consolidation, resulting in a stronger and healthier industry overall. Such challenges could also help spur incremental investment in clean coal technologies that will make coal use in this country and around the world cleaner, more efficient and more climate-friendly. In addition, the push for cleaner fuels

- and for a substitute for increasingly expensive, foreign, petroleum-based fuels - could prompt a renewed push for coal-to-liquids technologies.

Start Here

We've assembled the right pieces to excel in this current market cycle. Our short-term goal will be continued margin enhancement at our existing operations. Longer term, we will continue to evaluate internal growth options, such as mine development in the Illinois Basin and Montana. Beyond that, we will pursue strategic growth opportunities – particularly those that can contribute to our participation in the Asia-Pacific growth markets. But, as our history shows, we will do so prudently.

Our goal is to be the continued industry leader in safety and environmental performance, to deliver even better financial results, to generate increasing returns above our cost of capital and to re-deploy our free cash flow in ways that benefit our shareholders.

We believe we're still at the outset of a major commodities super-cycle. **Start Here** to join us.

Steven F. Leer

Chairman and Chief Executive Officer March 1, 2011

Steven 7. Leer



Annual Report On Form 10-K For the Year Ended December 31, 2010

Arch Coal, Inc. Shareholder Information

Common Stock

Our common stock is listed and traded on the New York Stock Exchange under the ticker symbol ACI. On February 28, 2011, our common stock closed at \$33.53 and we had approximately 8,455 holders of record of our common stock on that date.

Dividends

Arch paid dividends on our common stock totaling \$0.39 per share in 2010. There is no assurance as to the amount or payment of dividends in future periods because they are dependent on our future earnings, capital requirements and financial condition.

Code of Business Conduct

We operate under a code of business conduct that applies to all of our salaried employees, including our chief executive officer, chief financial officer and chief accounting officer. The code is published under "Corporate Governance" at http://investor.archcoal.com.

Corporate Governance Guidelines

Our board of directors has adopted corporate governance guidelines that address various matters pertaining to director selection and duties. The guidelines are published under "Corporate Governance" at http://investor.archcoal.com.

Independent Public Accounting Firm

Ernst & Young LLP 190 Carondelet Plaza, Suite 1300 St. Louis, Missouri 63105

Financial Information

Please direct any inquiries or requests for documents to:

Investor Relations Arch Coal, Inc. One CityPlace Drive, Suite 300 St. Louis, Missouri 63141 (314) 994-2897 www.archcoal.com

Transfer Agent

Questions regarding shareholder records, stock transfers, stock certificates, dividends or other stock inquiries (other than our Dividend Reinvestment and Direct Stock Purchase Plan) should be directed to:

American Stock Transfer & Trust Company 6201 15th Avenue Brooklyn, New York 11219 (877) 390-3073 www.amstock.com

Requests for information about our dividend reinvestment and direct stock purchase plan should be directed to:

American Stock Transfer & Trust Company P.O. Box 922, Wall Street Station New York, New York 10269 (877) 390-3073 www.amstock.com

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President, Wold Oil Properties and Secretary/Treasurer, American Talc

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- (b) Nominating and Corporate Governance Committee
- (c) Finance Committee
- (d) Personnel and Compensation Committee
- (e) Energy and Environmental Policy Committee
 - * Committee Chair

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Chairman and
Chief Executive Officer

JOHN W. EAVES

President and Chief Operating Officer

C. HENRY BESTEN

Senior Vice President, Strategic Development

JOHN T. DREXLER

Senior Vice President and Chief Financial Officer

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