TESTIMONY OF RANDALL W. ATKINS
CHAIRMAN AND CEO OF RAMACO CARBON BEFORE THE HOUSE OF REPRESENTATIVES COMMITTEE ON NATURAL RESOURCES

Mr. Chairman and Representatives, it is an honor to appear before you to today to discuss a new, positive and potentially disruptive future for coal.

Coal today is thought of as a cheap fuel used in power plants. But we ask…*What if coal were too valuable to burn?*

We believe coal has a bright future…just not the way it has been historically considered. We see coal ultimately serving higher value purposes, far beyond energy production. That future is in what we call "**Coal to Products**".

At Ramaco Carbon, we believe recent developments in advanced materials and manufacturing technologies, combined with innovative new research sponsored by the Department of Energy (**DOE**) and the National Lab's will soon get us to this point.

We would ask Congress to support the DOE's and Ramaco's efforts to create an advanced technological and higher margin use for coal. This can lead to more sustainable long-term jobs for the coal industry and inspire a host of related manufacturing jobs.

The United States possesses the world's largest and cheapest coal reserves. This also means it holds the world's largest and cheapest *carbon* reserves. Coal is the cheapest and most abundant source of carbon.

Today most carbon products are expensive since they are made from petroleum. Although petroleum and coal have about the same percentage

of carbon (75%), a ton of petroleum costs about $500. A ton of Powder River coal costs roughly $12.

Ramaco is now privileged to be working with two DOE-affiliated National Labs, as well as some of the top minds in advanced materials research to create a "Carbon Valley" in Wyoming. The goal of this innovation will be to create carbon products from coal. Some of these products will sell for high margins. In many cases, they also require large volumes of coal as the basic carbon feedstock.

Carbon is becoming the dominant "advanced material" of the 21st century- think carbon fiber, graphene, graphite, nanotubes and carbon-based resins. If we could make these materials for less cost using coal, rather than petroleum, it could vastly disrupt many industries.

Carbon materials made from coal could be made stronger, lighter and cheaper and could improve or even replace basic metals like steel or aluminum. They could also be used for building products like cement, asphalt, rebar or roof shingles. Carbon from coal can be used to also make chemicals, resins and even medical life science products.

All of these are fast growing, game changing uses that can in some cases require, by our estimates, over 100 million tons of coal per year per use (see slide). When you consider the United States produced roughly 700 million tons of coal in 2017, even a few new disruptive uses can create a demand inflection point for the entire coal industry.

Who Are We?

At this point, I would like to briefly describe who we are. Seven years ago, my partners and I founded Ramaco Coal, which is now a coal-based

conglomerate with operations in five coal producing states. It consists of three companies:

Ramaco Resources, is a public metallurgical coal producer, which last year become the first public coal company IPO in over ten years. It operates in West Virginia, Virginia and Pennsylvania, where we have opened five new mines in the past twelve months and created over 300 direct jobs and a 5x multiple of indirect new jobs. We trade on NASDAQ under the symbol METC. www.ramacoresources.com

Ramaco Royalty is a private coal royalty company that owns roughly 300 million tons of metallurgical coal reserves in Appalachia.

Ramaco Carbon, is our private Wyoming based company focused on "Coal to Products". www.ramacocarbon.com

Ramaco Carbon is also the nation's first vertically integrated "Coal-Tech" company, as well as the only coal company pursuing a comprehensive mining, research and manufacturing platform to incubate "Coal to Products".

Our operations in Wyoming are:

- ❑ **COAL RESERVE**:
  The **Brook Mine,** with 1.1 billion tons of coal resource.

- ❑ **RESEARCH CENTER (iCAM - Carbon Advanced Materials Center)**:
  A research center called the **iCAM,** which will house national laboratories, university and private research groups conducting research to commercialize coal-based carbon products.

- ❑ **INDUSTRIAL PARK (Wyoming iPark)**:

A "**coal to products**" mine-mouth industrial park called the **iPark,** where research from the **iCAM,** and coal from the **Brook Mine** will be used to manufacture advanced carbon products.

Our partners comprise two of our National Labs - The National Energy Technology Lab (**NETL**) and the Oak Ridge National Laboratory (**ORNL**). They also include the Grossman Group from MIT, Silicon Valley based 3D printing manufacturer Carbon, Inc., the Fluor Corporation, as well as the Western and Southern Research Institutes and Ohio University.

Ramaco Carbon is also a participant in a current DOE grant we call "Coal to Cars, where we are developing coal as a low-cost precursor to make carbon fiber to be used in vehicles.

What Are We Focused on?

Ramaco is focusing on four broad uses:

1) Coal to Resins for 3D Printing
2) Coal to Carbon Fiber
3) Coal to Building Products
4) Coal to Medical Technologies

I have provided the Committee with a recent presentation and short video clip which expounds on these opportunities in more detail.

Conclusion

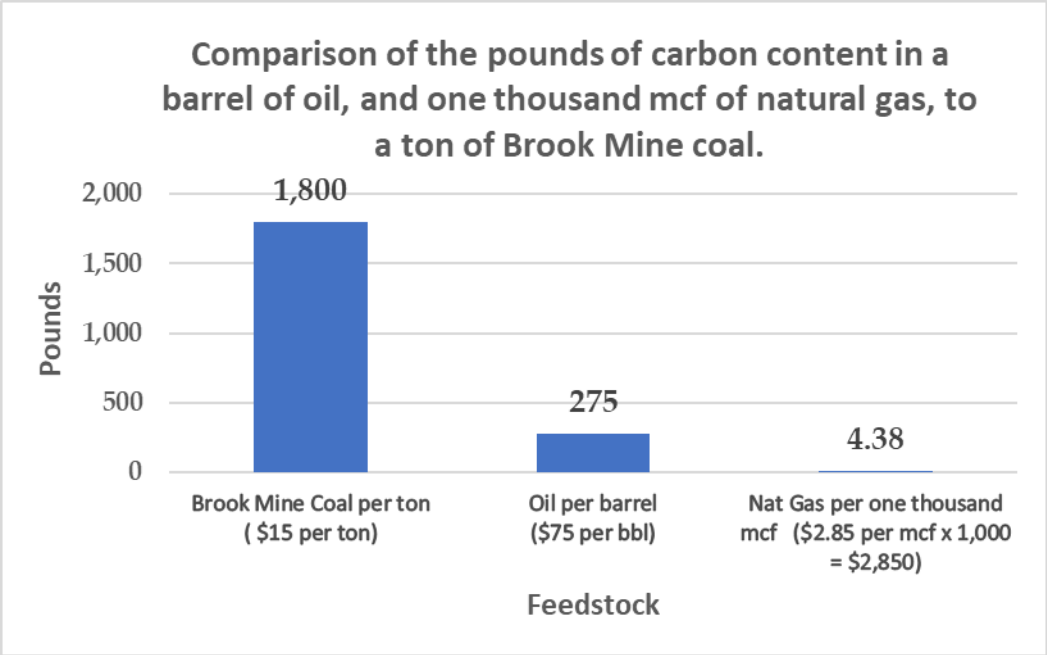
In summary, we feel coal needs its own "Carbon Valley" to unlock it's full economic and social potential. At Ramaco. we are creating the first and only industry platform to vertically integrate the opportunity.

The United States is blessed with both the largest reserves of coal and carbon in the world and the technological prowess to fundamentally reorient the world's coal industry. As policy makers, we ask Congress to support the innovation and research critical to realizing the scale of the opportunity. We feel these efforts will create a higher value and technological use of coal, with all the positive employment, social, environmental and economic impacts that it would bring.

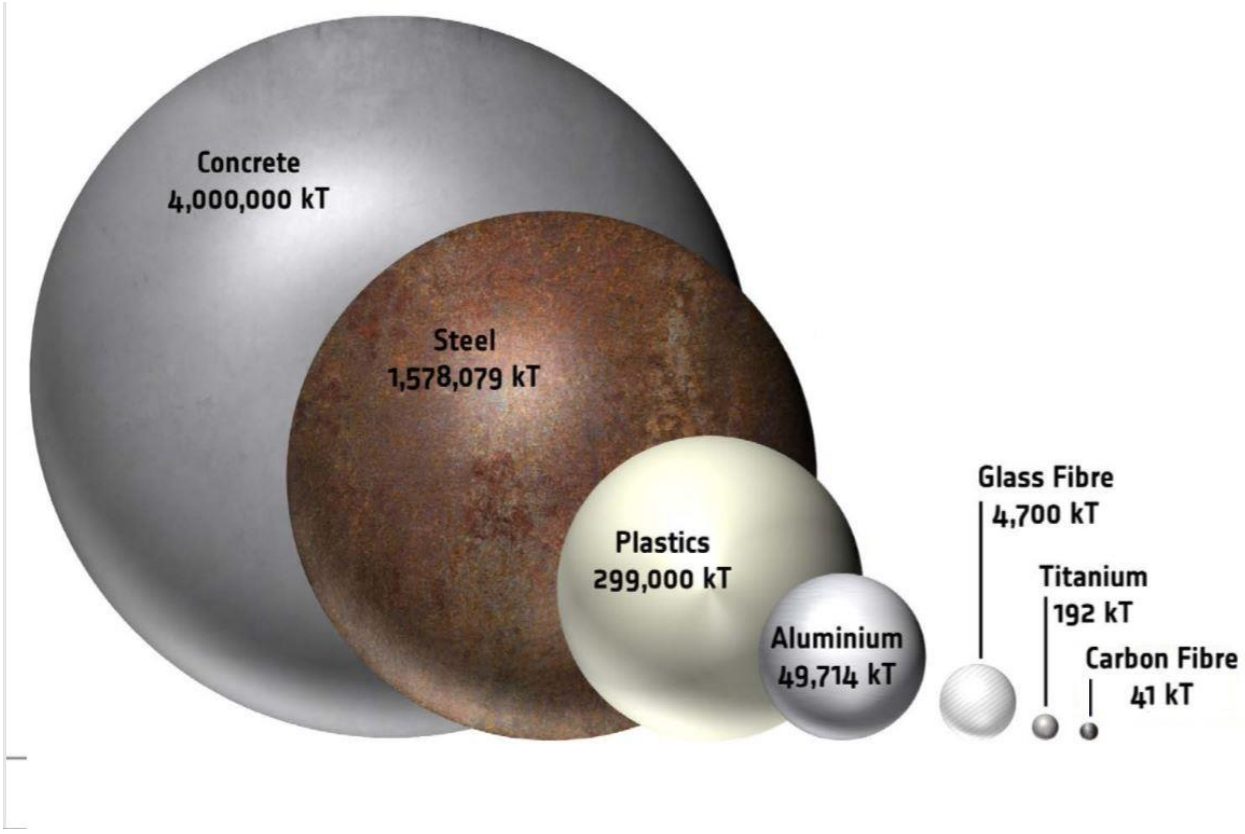
To close, we should never underestimate the power of carbon…all from a lump of coal.

I deeply thank you for your time and would be delighted to address any questions you might have.

COST COMPARISON OF CARBON FROM COAL AND OTHER ENERGY SOURCES



MATERIAL ENHANCEMENT AND SUBSTITUTION OPPORTUNITIES FOR COAL



Annual amount of coal needed to replace (in millions of tons):

Carbon Fiber (12% CAGR):	225,000 MT
Titanium:	1,054,000 MT
Glass Fiber:	25,827,000 MT

THE NEW COAL TREE