



Thoughts on Coal-to-Products in West Virginia's Energy Future

2022 West Virginia Governor's Energy Summit: Building West Virginia's Energy Future

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Outline of Presentation on Developing a Coal-to-Products State-wide Enterprise

1. Stories about Economic Development Challenges
2. Overview of Coal-to-Products Opportunities
3. Vision / Wishful Thinking / Action Steps

1. Stories About Economic Development Challenges

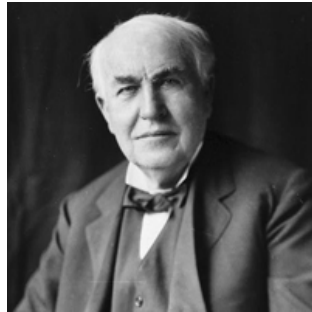


Small Businesses ← → Large Enterprises

Entrepreneurial Economic Development

People Needed

1. Talent
2. Entrepreneurship Ecosystem
3. Customers
4. Visionaries / Integrators



Function Performed

1. Inventors / Technologists
2. Consultants on Business
3. People who pay for products manufactured (pays investors)
4. Folks who bring the enterprise together

African Expression Applied to Economic Development

If you want to go someplace fast, go alone

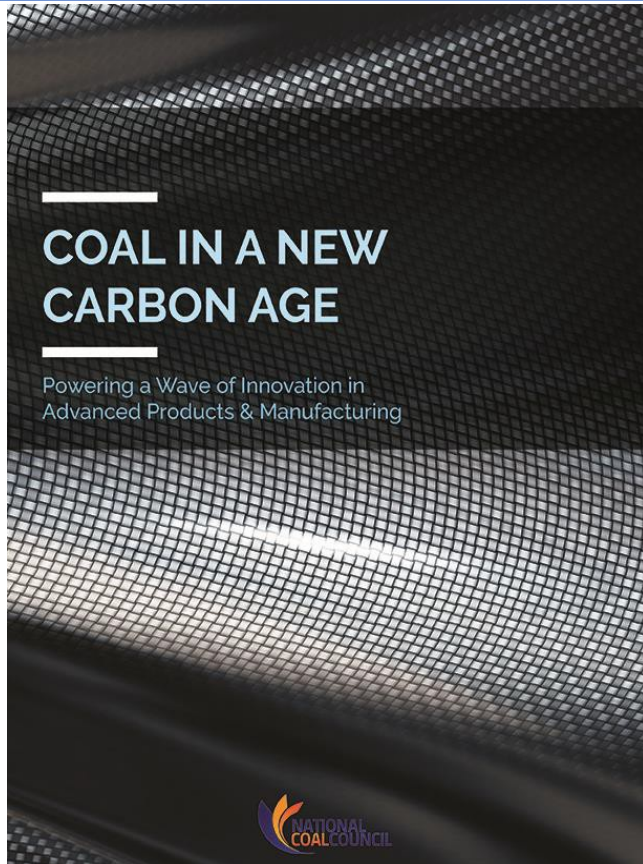
If you want to go someplace far, go together



Lessons Learned in Collaborative Projects

- *Let's Compromise and Find a Way for Everyone to Win*
- *Let's Make Investments rather than Wait for the Best Solution*

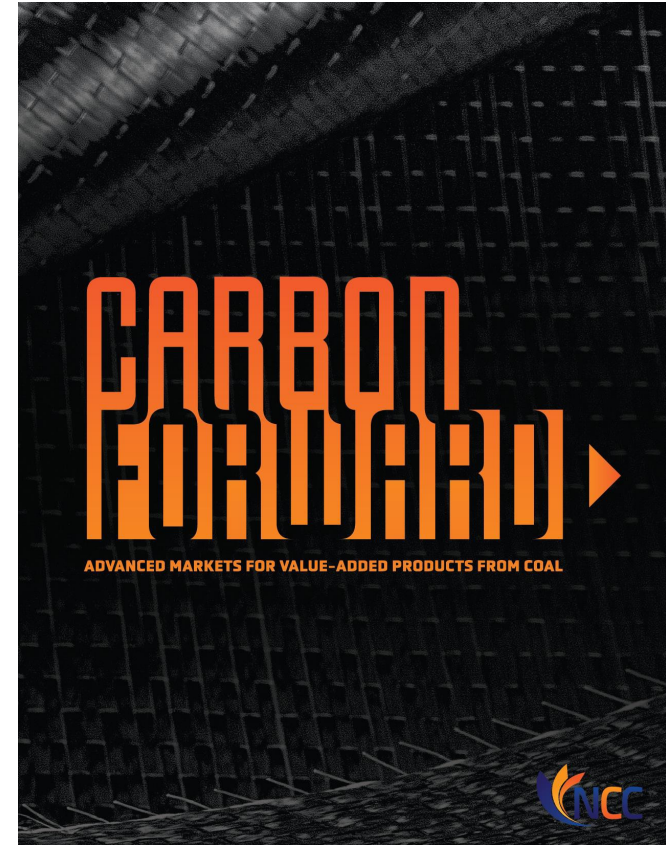
2. Overview of Coal-to-Products Opportunities



National Coal Council
Reports:

← 2019 – Coal in a
New Carbon Age

2021 – Carbon
Forward →

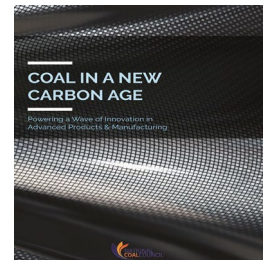


Copies can be downloaded from “ ResearchRepository.wvu.edu/ncc_reports ”

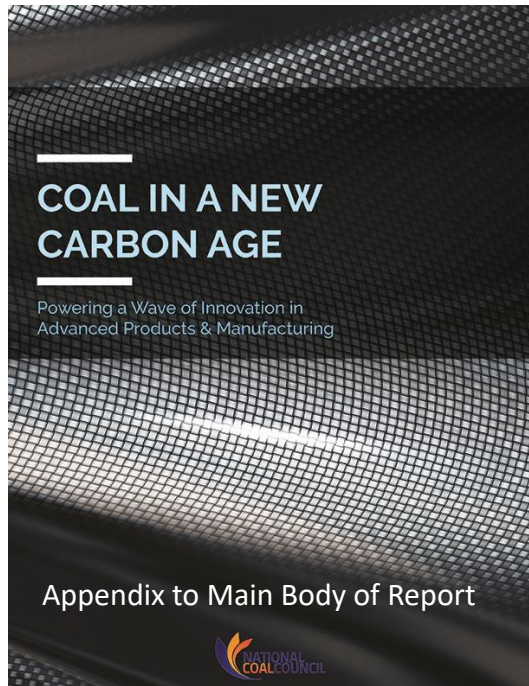
Materials Producing via Coal Conversion Technologies

Ref: Coal in a New Carbon Age Report 2019

- Coal to Liquids: fuels and chemicals
- Coal to Solid Carbon Products: carbon fiber, activated carbon, graphite, electrodes, graphene, building and construction products, carbon foam and carbon black
- Rare Earth Elements: component minerals for health care, military, transportation, power generation, petroleum refining and electronics applications
- Coal Beneficiation: quality enhancements to coal for specialty product applications
- Life Science, Biotech and Medical: prosthetics and biosensors
- Agricultural Uses: fertilizer and soil amendments



Appendices: What There Is to Know about Products



Appendix to the Main Report: Coal In A New Carbon Age
National Coal Council

Contents:

- Technologies and Market Description – Appendix A
- Technology Compendium – Appendix B
 - ❑ Technology Maturity and Market Opportunity Matrix
 - ❑ Specific Examples of Business Enterprises

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International Markets for Carbon Products

Ref: Carbon Forward Report 2021

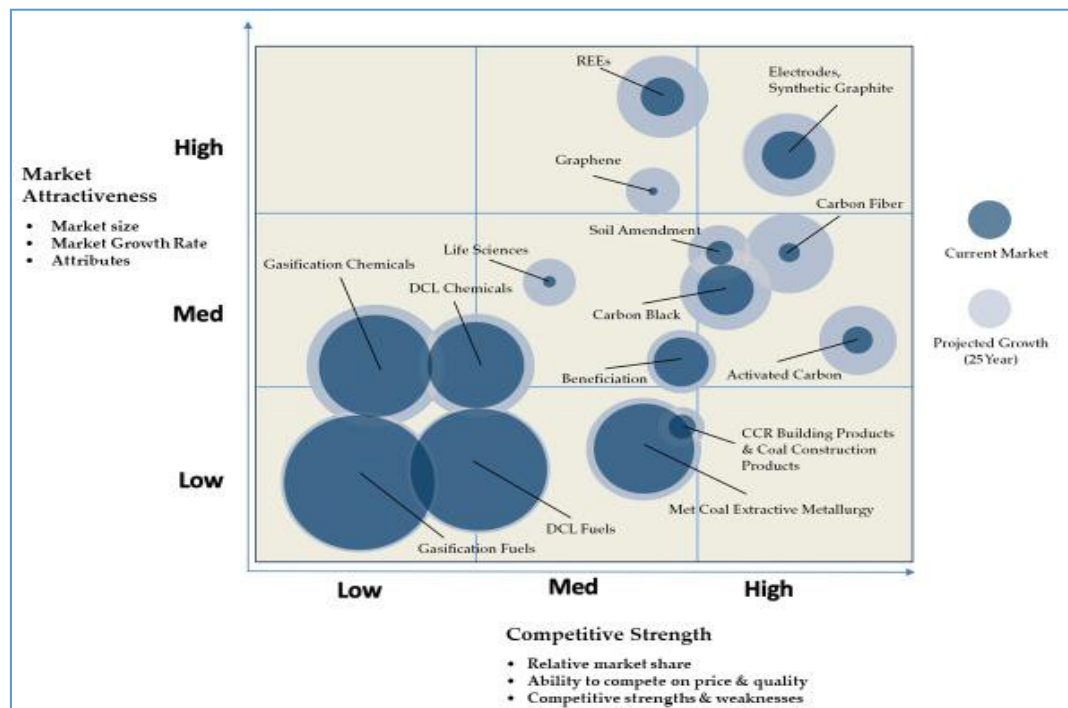
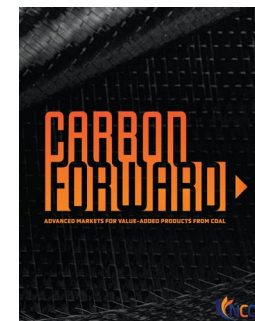


Illustration of Analysis Results on Market Size and Value for Different Coal Products from 2021 Report



3. Vision / Wishful Thinking / Opportunity

Work Collaboratively with Other Regions / States to Establish a Manufacturing Enterprise for Carbon Products

- Construct a plant (or plants) to produce the carbon “ores” for manufacturers
- Locate the carbon conversion plant near to coal supplies
- Provide specialty carbon ores to various manufacturing businesses
- Work with local communities to obtain local buy-in support for hosting manufacturers
- Ensure all regions benefit from the enterprise: prosperity; environment,

Resources at Hand

- Quality coals for conversion to products are available in WV and adjacent states
- WV has a history of:
 - Manufacturing coal conversion products;
 - Working with NETL
 - Teaming with major coal-focused universities on extraction, reclamation, conversion, and carbon management programs
 - Working with industry on alternative uses of coal projects
- Resources in workers and business sites that could be repurposed; Regional Colleges provide workforce training
- Example: Ethane Cracker Plant in Monaca, PA to produce foundational products to spur wide-ranging manufacturing enterprises
- Coalfields Development Corporation award supports economic development initiatives

Next Steps - “Can We Talk About This”

- ☐ Discuss concept further at this Energy Summit
- ☐ Encourage participation by State governmental units, WV Regional Economic Development organizations
- ☐ Learn more and engage with organizations like the Entrepreneurship Ecosystem and Bridging Innovation groups
- ☐ Work with successful programs like the Coalfields Development Corporation
- ☐

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