



# North Dakota House of Representatives

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## **Representative Anna S. Novak**

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## **COMMITTEES:**

Education  
Energy and Natural Resources

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Mr. Chairman, members of the committee – for the record, my name is Anna Novak, representative from District 33, proudly serving Coal Country. You have before you HB1511. This bill incentivizes new companies, that are interested in using coal as a feedstock for their end-products, to come to North Dakota by offering them up-front tax breaks. Specifically, this bill does two things:

1. Provides a sales and use tax exemption for materials used to construct or expand a coal processing facility that utilizes coal as a feedstock.
2. Provides severance and sales and use tax exemptions for coal used in a coal processing facility that utilizes coal as a feedstock.

Possibilities for businesses that might take advantage of these incentives would be those for the extraction of rare earth elements or high-tech building materials made by coal.

Critical minerals and rare earth elements are needed for basically anything in the technology sector. From our cell phones, the computer chips in laptops, vehicles and military aircraft, critical minerals and rare earth elements are a major component used in the devices that keep us connected. Nearly 100% of these materials are secured from China so at this time, we are completely reliant upon them for these items. Obviously, it's not good to be reliant on another country for anything, but for that country to be communist China is a very big problem. It's a national security risk. It's also estimated that China will run out of these materials in the next 10 years, so regardless of the desire to halt business with them, it's a necessity to find these materials elsewhere. I've included some information I obtained when I visited the EERC last fall. Please pull out the first handout, titled "Rare Earth Elements". I'd like you to look at the Periodic Table section on the front. On the left, it shows an iPhone and lists some of the elements needed to create a few of the different components within it. If you look to the right, you'll see the Periodic Table. The elements with a blue box around them are elements that have been located within North Dakota's lignite coal seams. As you can see, there are high concentrations of extremely important and valuable materials right here in North Dakota.

Lignite coal is also used in high-grade building materials. From siding, deck materials or even cement production, there are many different uses for coal. And oftentimes, the products made by using coal as a feedstock are lighter, more durable and are much stronger than their traditional counterparts. I've included a second handout from the EERC, titled "Economic Development in Coal Regions of North Dakota". This one gives some great examples of different building materials made by using coal.

The coal mines here in North Dakota are not just already permitted but are already operating. Between that and our state's business-friendly environment and the favorable tax policy in HB1511, I whole-heartedly believe North Dakota will stand out from other states when a company is choosing where they want to do business. There are many parts of



the country that have large deposits of coal and are looking to diversify their uses of coal beyond what coal is typically used for – electricity generation.

Just last week, I had the opportunity to meet with a company that is interested in using our lignite coal for rare earth elements extraction. This business builds lighting devices and needs a domestic supply chain. During our conversation, they told me that the landscape for coal mining in the US has shifted dramatically. Ten years ago, there were many new coal mines projected to open; however, that has since changed and makes it so much more important to utilize the mines that are open, especially considering that the federal government is making the permitting process more difficult. The company representatives also discussed the business-friendly environment here in North Dakota, and this bill only sweetens the pot for companies like theirs. No deals have been solidified but I'm very optimistic! I have to give a shout-out to the EERC on connecting this company to our state, and for all of the incredible research they do for North Dakota's energy industries. We are so fortunate to have the EERC within the borders of our state!

We have an incredible opportunity to develop extremely valuable coal byproducts right here in North Dakota. It's truly a "plus one" for our state and for my district specifically because the materials must be processed on site. After the supply chain issues, we all experienced the last three years, I believe there is an awareness of how important it is for America to focus on keeping our supply chains here. We can do that in North Dakota and the time is now. David Straley from NACCO industries has been incredibly helpful in crafting this bill and his here to testify, in addition to several other people, including Brian Kalk from the EERC and Jonathan Fortner with the Lignite Energy Council. Technical questions would probably be best directed to them, but I would be happy to answer any questions you might have for me. Thank you.





## WHY ARE RARE-EARTH ELEMENTS IMPORTANT?

Rare-earth elements (REEs) are elements with special properties that make them useful in high-technology products, such as smart phones, catalysts, hard drives, hybrid electric vehicle engines, lasers, magnets, medical devices, and televisions.



## NEW SOURCES OF REEs ARE NEEDED

Currently, the United States is 100% reliant on imports of REEs. China dominates the global market, with over 80% of REE production in 2017. Major growth market, sectors such as wind turbines, hybrid/electric vehicles, and electronics are dependent on REEs. The lack of domestic resources of REEs could be considered a risk to national security and economic prosperity. Coal and coal by-products have been identified as promising domestic sources of REEs.



It is estimated that China's high REE resources will be gone by 2025. The most critical REEs are those deemed as having a supply risk and being highly important to U.S. national security and clean energy technologies going forward.



iPhone

Color Screen	Y, La, Pr, Eu, Gd, Tb, Dy
Phone Circuitry	La, Pr, Nd, Eu, Gd
Speakers	Pr, Nd, Gd, Dy
Vibration unit	Nd, Tb, Dy



## Hybrid Electric Vehicle

Motor	Nd, Pr, Tb,Dy
Batteries	La, Ce, Pr, Nd
Operating System	Nd, Pr, Tb,Dy

REEs

\* Lanthanide Series

\*\* Actinide Series

lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), promethium (Pm), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu) and transition elements scandium (Sc) and yttrium (Y)



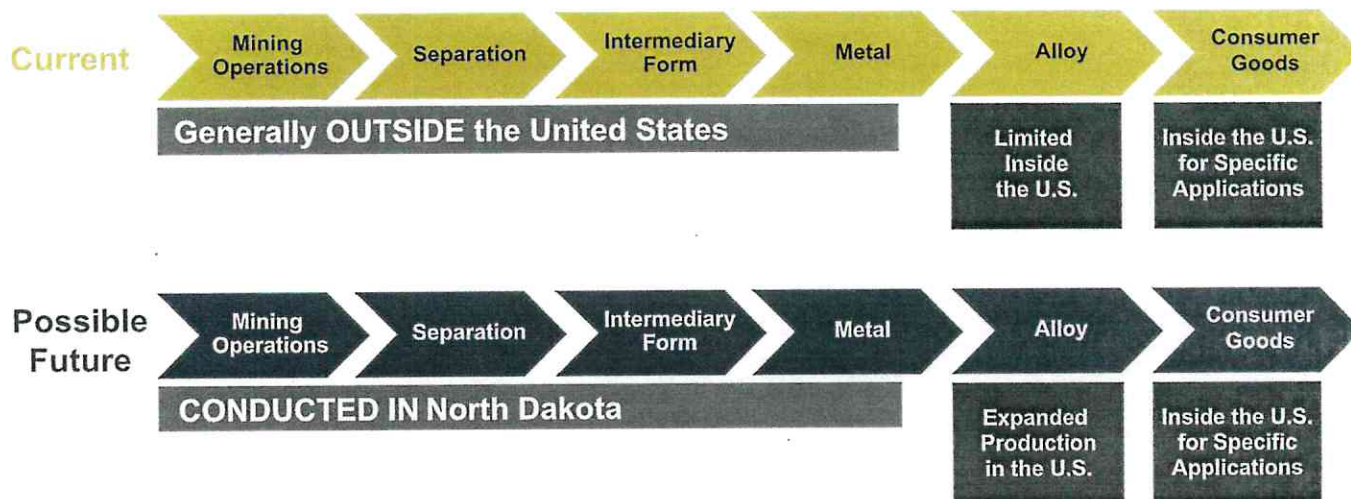
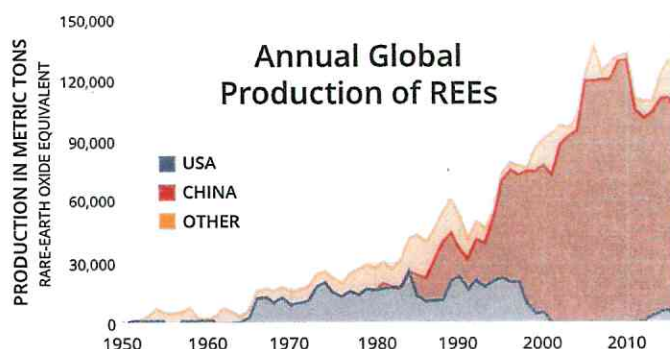


## ADVANCING NEW SOURCES OF REEs

The Energy & Environmental Research Center (EERC) is leading several research projects on REEs. We are targeting resources that are associated with the lignite industry in North Dakota for REE recovery. This provides a unique opportunity for leveraging an existing industry that has taken the time and expense to develop the coal mines and utilization infrastructure, reducing the time line to begin an operation for extracting and producing REEs. Value-added usage of low-cost materials associated with the lignite industry also provides unique opportunities to be economically and environmentally responsible.

Despite their name, REEs are not actually rare but are highly distributed. This results in ores where REE content is measured in parts per million (ppm).

Our work has identified coal seams in North Dakota with REE concentrations as high as anything ever measured in coal in the United States. North Dakota is home to the world's largest lignite deposit – 350 billion tons, or enough to provide electricity for the next 800 years. In just one identified coal seam in North Dakota, the potential REE reserves could be 2 million tons. The United States currently uses approximately 16,000 tons of REEs a year.



We are leading the way in REE research and in identifying domestic resources.

For more information on our work with REEs, contact:

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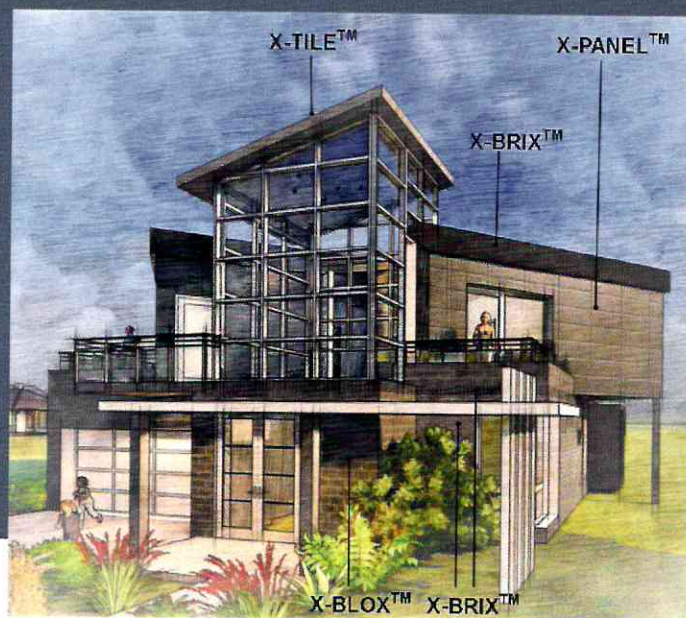




# Economic Development in Coal Regions of North Dakota



THE ENERGY & ENVIRONMENTAL RESEARCH CENTER (EERC) HAS BEEN BUILDING on fundamental and applied research work to develop technologies to take advantage of the existing large deposits of lignite carbon ore in the state. These technologies range in technology readiness levels from benchtop laboratory success to large pilot-scale development processes that will be "shovel-ready" for the commercial demonstration phase. The EERC vision is to develop current in-house and commercial partner technologies to bring about the required economic development in the region by clustering industries near existing coal production and utilization operations. The following near-commercial-ready projects are examples from a portfolio of possibilities.



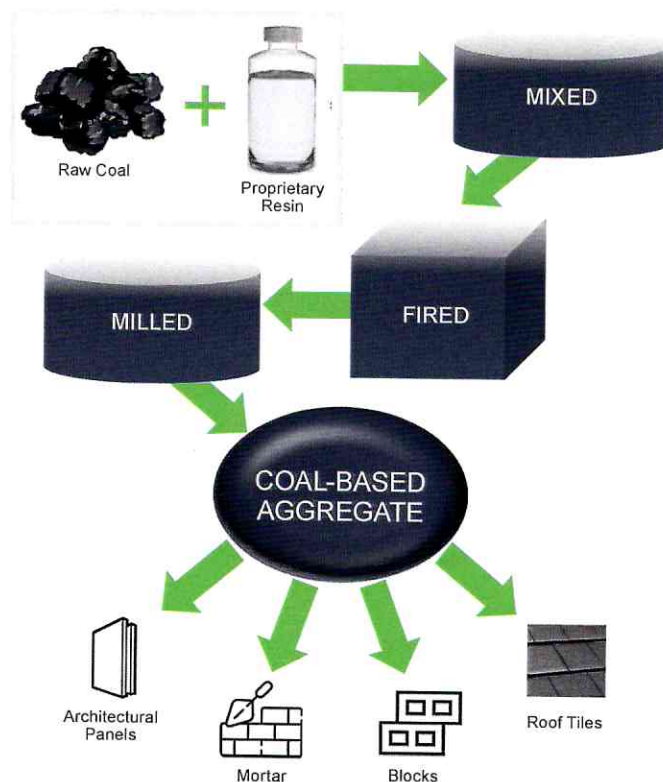
## COAL-DERIVED BUILDING COMPONENTS (CDBC) PRELIMINARY BUILDING DESIGN STUDIES

CDBC of the future requires the manufacture of high-performance, strong, lightweight, fire- and heat-resistant interlocking X-TILES™, X-PANELS™, X-BLOX™, X-BRIX™, and X-MATRIX™ and X-MORTAR™ composite aggregates.

CDBCs utilize a significant amount of low-cost, abundant coal and coal waste and create a new market for innovative coal-derived products vital to a modern and growing construction industry.

## COAL-BASED ENGINEERED AGGREGATE

Coal-based engineered aggregate is coal powder or coal waste mixed with proprietary inorganic polymers.



Roof Tiles

Architectural Panels



Lightweight Coal-Based Ceramic Aggregate (the darker features)



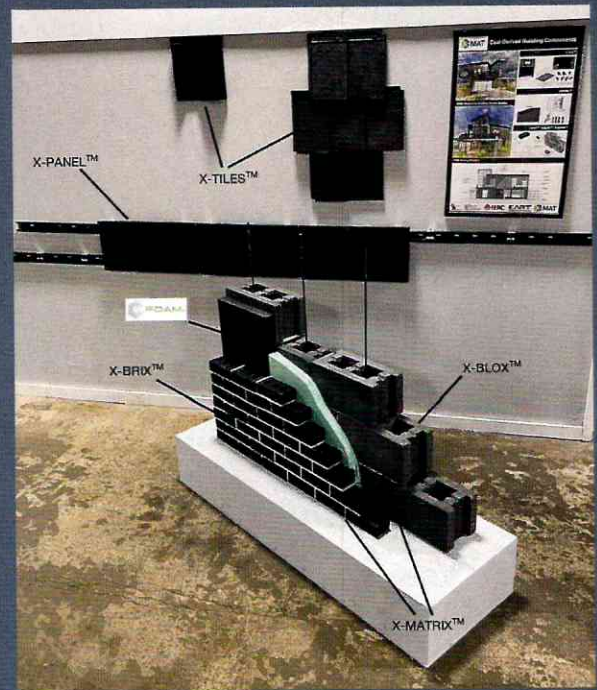


## PROTOTYPE WALL SECTION

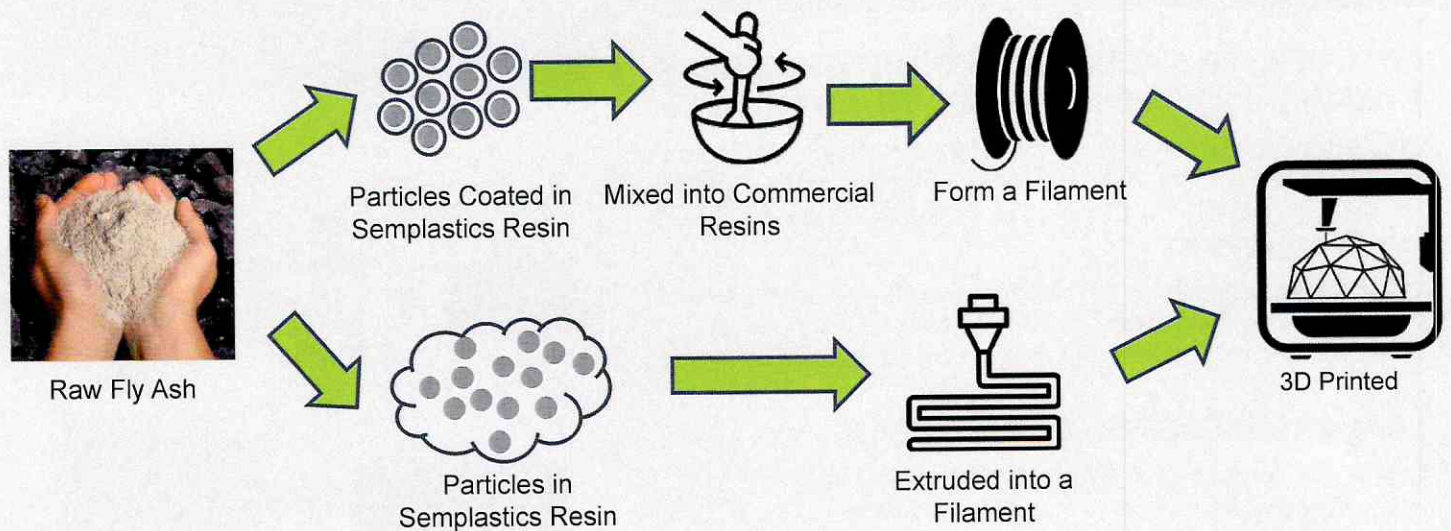
Blocks and bricks made with coal-based engineered aggregate compared to traditional building materials have:

- Superior mechanical strength and lower weight.
- Greater hardness and improved toughness.
- Greater abrasion resistance.
- Greater chemical resistance than concrete.

When coal particles are encapsulated and bonded with polymer-derived ceramic (PDC), the lignite coal used in the building materials becomes nontoxic and fire-resistant, making them safer than traditional options.



## 3D PRINTING COAL WASTE



These new industries will succeed in **creating sustainable jobs** for tomorrow's market through:

- Synergy: natural resources, energy systems, and **innovative technologies**.
- Expansion of **North Dakota lignite**.
- Production, utilization, and export of **environmentally sound** carbon products.
- Manufacture of new **technology innovations**.

For more information, contact:

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