



# North Dakota House of Representatives

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## Representative Anna S. Novak

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## COMMITTEES:

Education  
Energy and Natural Resources

February 6, 2023

Mr. Chairman and members of the committee, for the record, my name is Anna Novak, Representative from District 33, the heart of Coal Country. I am here in support of the Amendment to the Industrial Commission's Budget of \$4.5 million dollars for projects relating to critical elements and rare earth metals.

Critical elements and rare earth metals are needed for basically anything in the technology sector. From our cell phones, the computer chips in laptops or vehicles and military aircraft, critical minerals and rare elements are used in almost everything in our society. Nearly 100% of these materials are secured from China so right now, 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. I would consider it to be a national security risk. It's also estimated that China will run out of these materials in the next 5-10 years so regardless of the desire to halt business with China, it's a necessity to find these materials elsewhere.

I've included some information I obtained when I visited the EERC last fall. I'd like you to take a 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 some 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. The mines where we'd get the coal are already permitted. I have a bill being heard later this week that provides tax incentives to draw businesses here for this. Combine those two things with North Dakota's business-friendly environment and we are positioned extremely well to be the best place in America possible for businesses to set up shop for the extraction and production of these valuable materials.

Over the years, the state legislature has allocated funds to research the concentrations of these elements in our lignite coal. And the research has shown us that North Dakota coal seams have high concentrations of critical elements and rare earth metals. In fact, North Dakota coal has higher concentrations than many other coal seams tested in the United States. One of the reasons why this funding is so important to me is because the processing of the materials has to take place where it's mined, so this would be a big win for coal country!

I realize that there is already some money allocated towards critical and rare earth research this session within the Industrial Commission's budget, but this request is geared towards the next phase. Not just the research, but getting us closer to project viability – kind of a "Phase 2" – and going towards specific projects. And while most of the funds will most likely go towards critical and rare earth research for lignite coal, it's worth noting that the funds can be used for other feedstocks, like natural gas or oil.

You have all kinds of worthy projects that need to be funded. But this funding is something that could really spur innovation, and the return on investment to the state of North Dakota could be in the billions. I strongly urge you to support this amendment to add \$4.5m to the Industrial Commission's budget and will stand for any questions you may have. Thank you!

## WHY ARE RARE-EARTH ELEMENTS IMPORTANT?

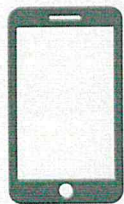
Rare-earth elements (REEs) are elements with special properties that make them useful in high-technology products, such as smart phones, catalysts, hard drives, hybrid electric vehicle engines, lasers, magnets, medical devices, and televisions.



## NEW SOURCES OF REEs ARE NEEDED

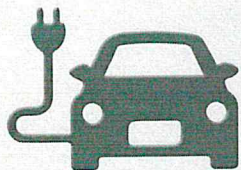
Currently, the United States is 100% reliant on imports of REEs. China dominates the global market, with over 80% of REE production in 2017. Major growth market, sectors such as wind turbines, hybrid/electric vehicles, and electronics are dependent on REEs. The lack of domestic resources of REEs could 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

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\* Lanthanide Series

\*\* Actinide Series

Source: Callahan, Michael. PSU.edu. Web Blog. <http://www.personal.psu.edu/mjc5169/text.html>

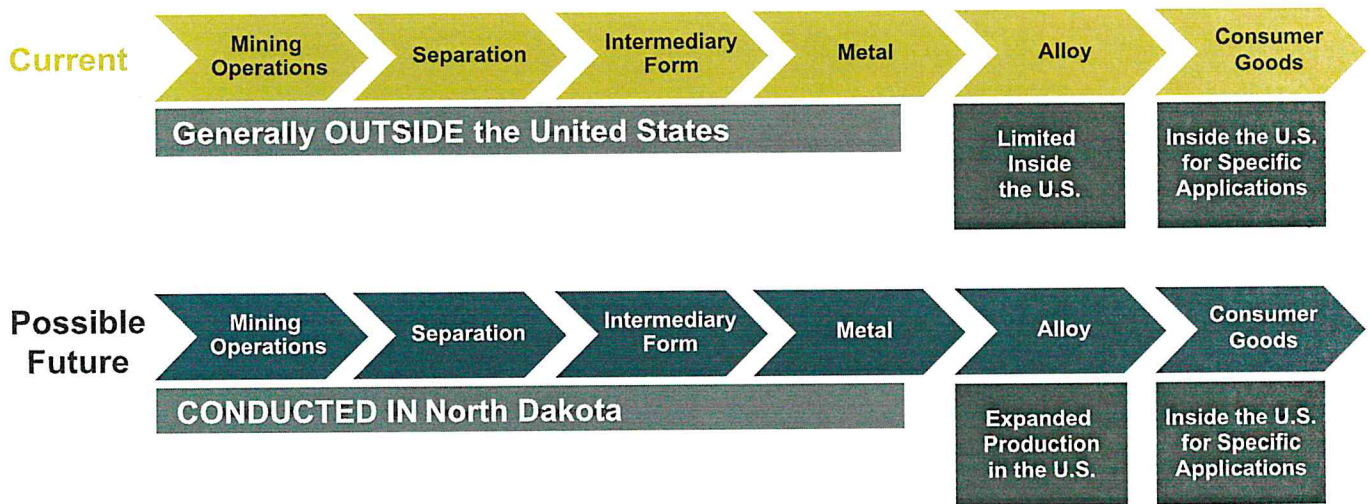
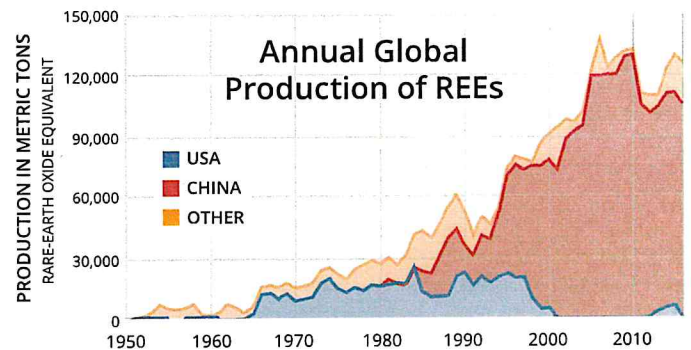
lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), promethium (Pm), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu) and transition elements scandium (Sc) and yttrium (Y)

## 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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