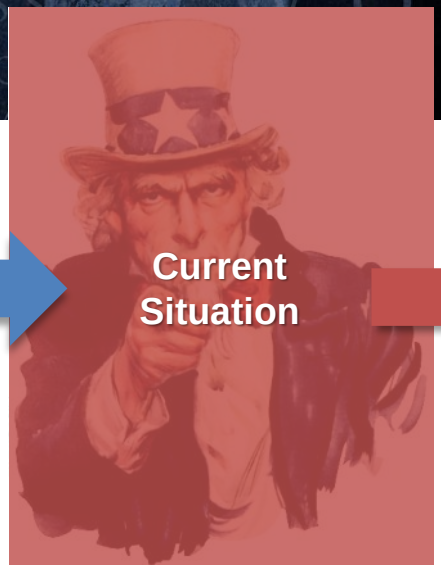
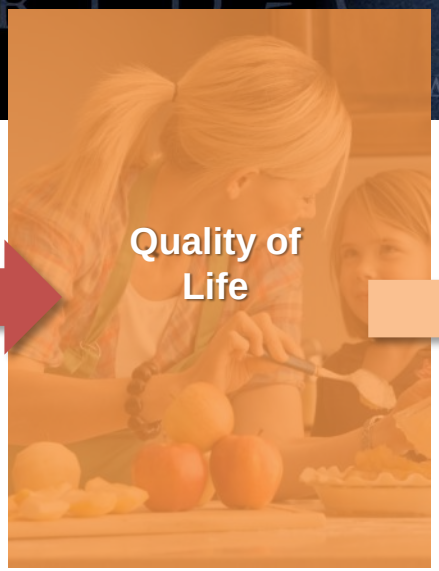
APPENDIX F





North Dakota Collective Vision for Energy Resource Management (ERM)

EERC
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Putting Research into Practice

NORTH DAKOTA ENERGY RESOURCE MANAGEMENT

- Oil
- Natural gas
- Coal
- Wind
- Biomass-based fuels
- Carbon management
- Water
- ✓ **All of the above**

WORKING TOGETHER

EERC
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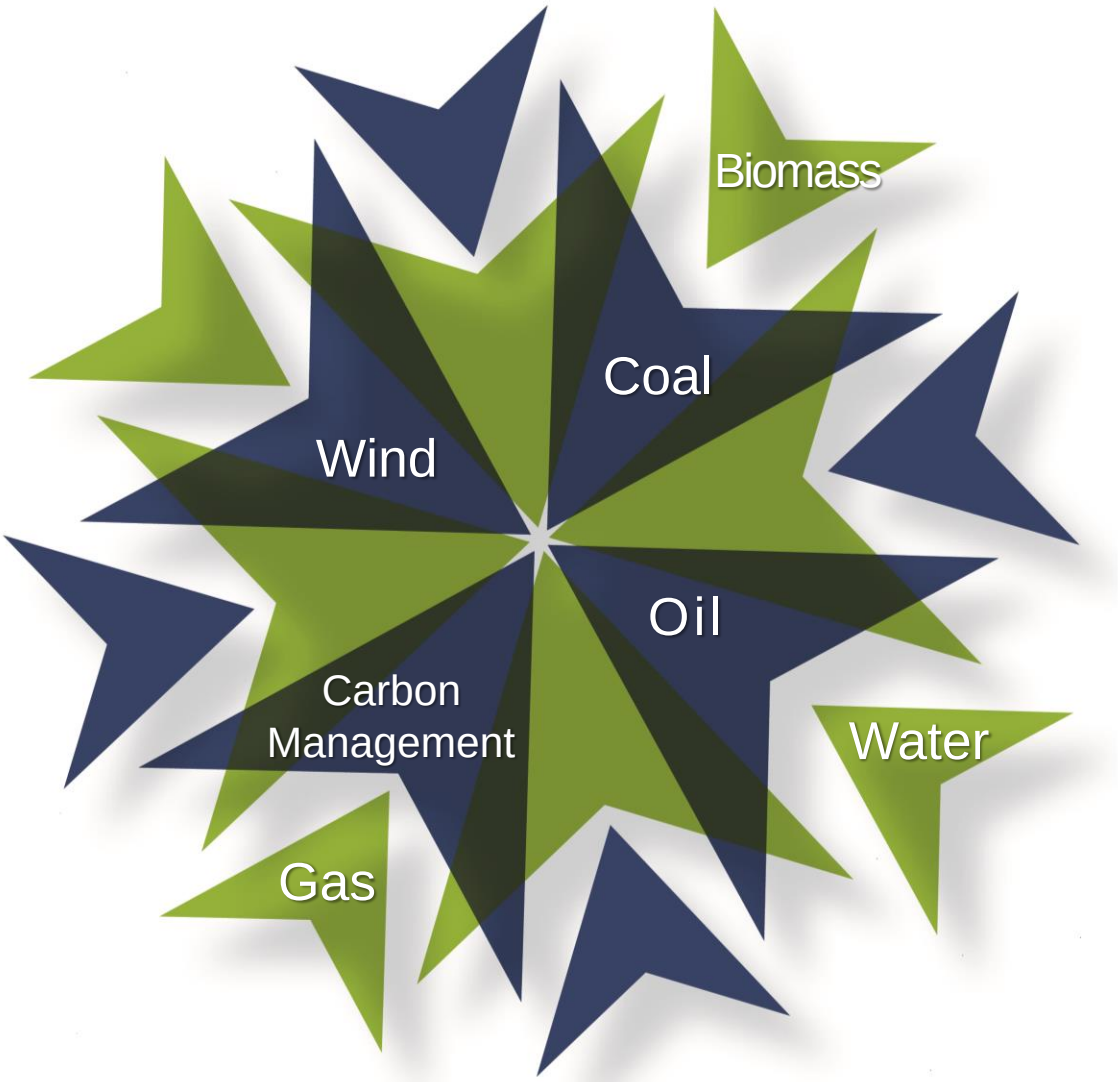
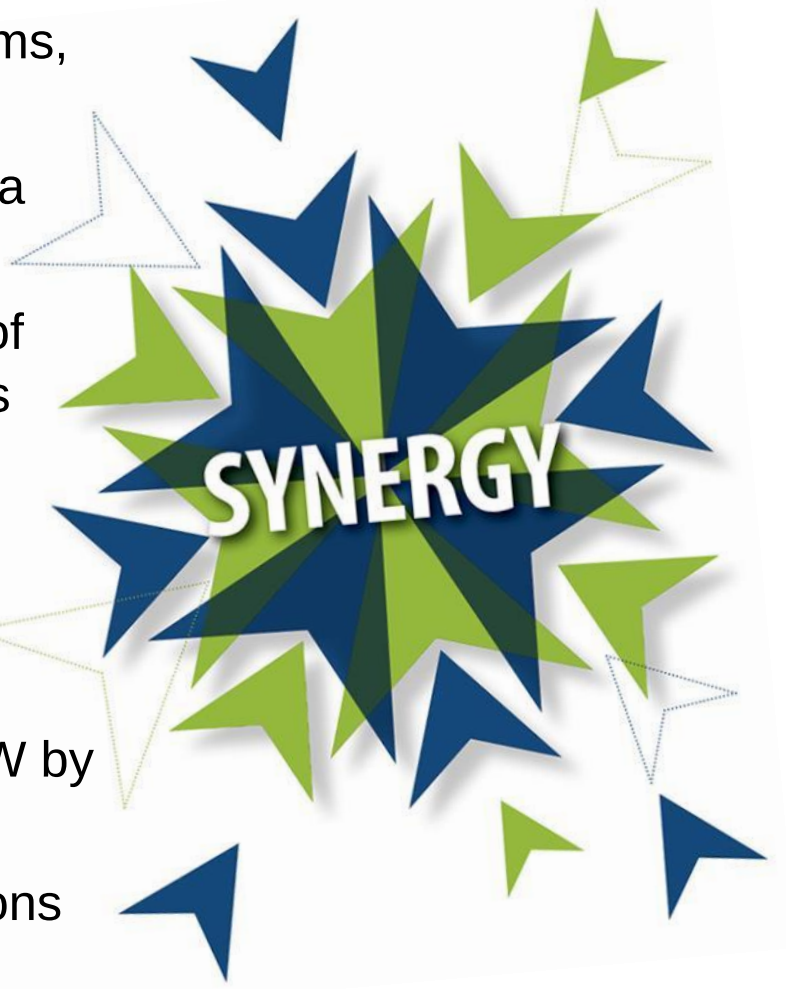
WORKING TOGETHER



NORTH DAKOTA COLLECTIVE VISION FOR ENERGY RESOURCE MANAGEMENT

- **Synergy**: natural resources, energy systems, and innovative technologies
- **Sustainable expansion** of North Dakota lignite and agricultural resources
- **Production, utilization, and export** of environmentally sound, low-carbon products
  - Liquid fuels
  - Chemical feedstocks and fertilizer
  - Oil
  - CO_2 for EOR
  - Electricity (North Dakota needs +2500 MW by 2032)
- **Manufacture** of new technology innovations



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NORTH DAKOTA COLLECTIVE VISION FOR ENERGY RESOURCE MANAGEMENT

Sustainable
Reliable
Affordable

EPIC*

Transforming Resources from the Prairie to Clean Power and Products for the World

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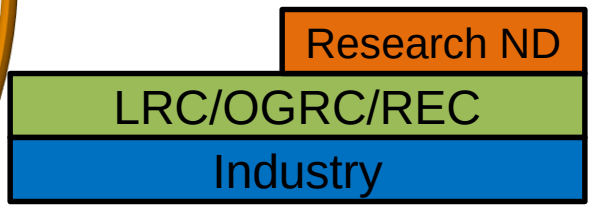
*Energy Polygeneration Industrial Complex

RESEARCH FUNDING

Previous Projects (federal direct)

- Mercury fundamentals
- Combustion inorganic transformations
- Project Sodium
- CO_2 fundamentals
- Agricultural oil cracking
- Fine particulate characteristics



Fundamentals Idea Concept Prototype Demonstration Commercial

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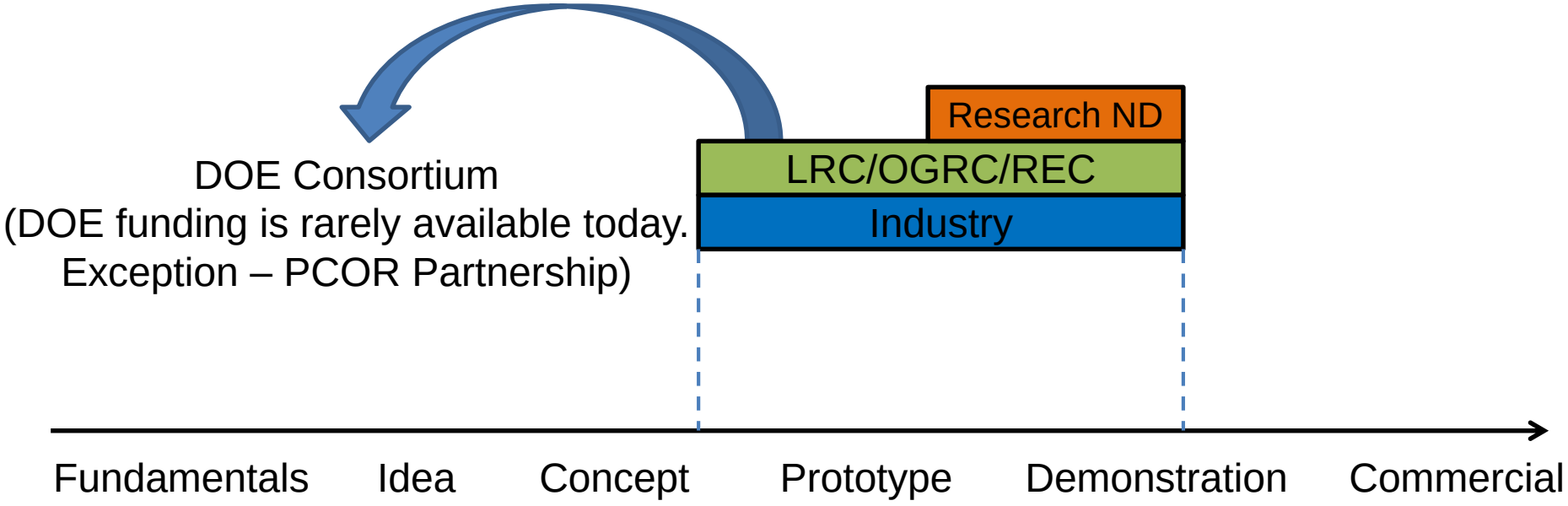
RESEARCH FUNDING

Select Missing Programs
Fundamentals of CO_2 capture
Subsurface characterization
Biomass processing and economics
Plant cycling and energy storage
Advanced analytical and monitoring technologies



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NORTH DAKOTA OPPORTUNITIES FOR CARBON MANAGEMENT

- Oil and gas
  - CO_2 EOR
  - Natural gas constituent EOR
  - Bakken EOR
- Coal
  - Carbon management system
- Wind–biomass integration

North Dakota: Proud History of Pioneering

Current Situation

Quality of Life

EERC Experience

North Dakota Collective Vision for Energy Resource Management (ERM)

Time to Be Pioneers Again!

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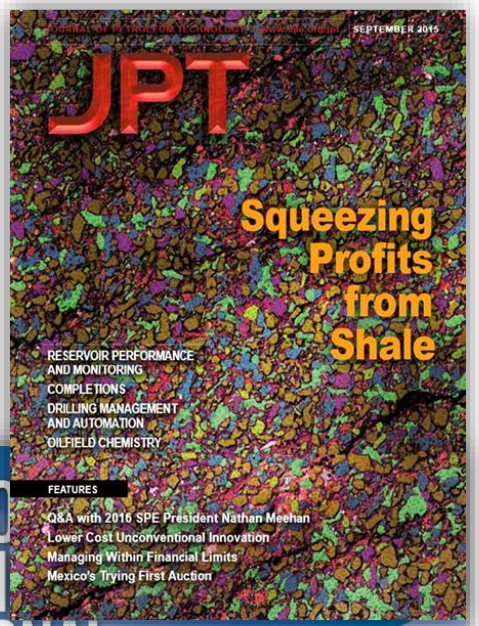
IN A NEW SQUEEZE

NORTH DAKOTA PIONEERS

- Determination
- Intelligence
- Ingenuity
- Pride
- Willingness to work together



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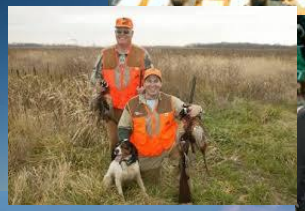
NORTH DAKOTA'S NEW PIONEERS



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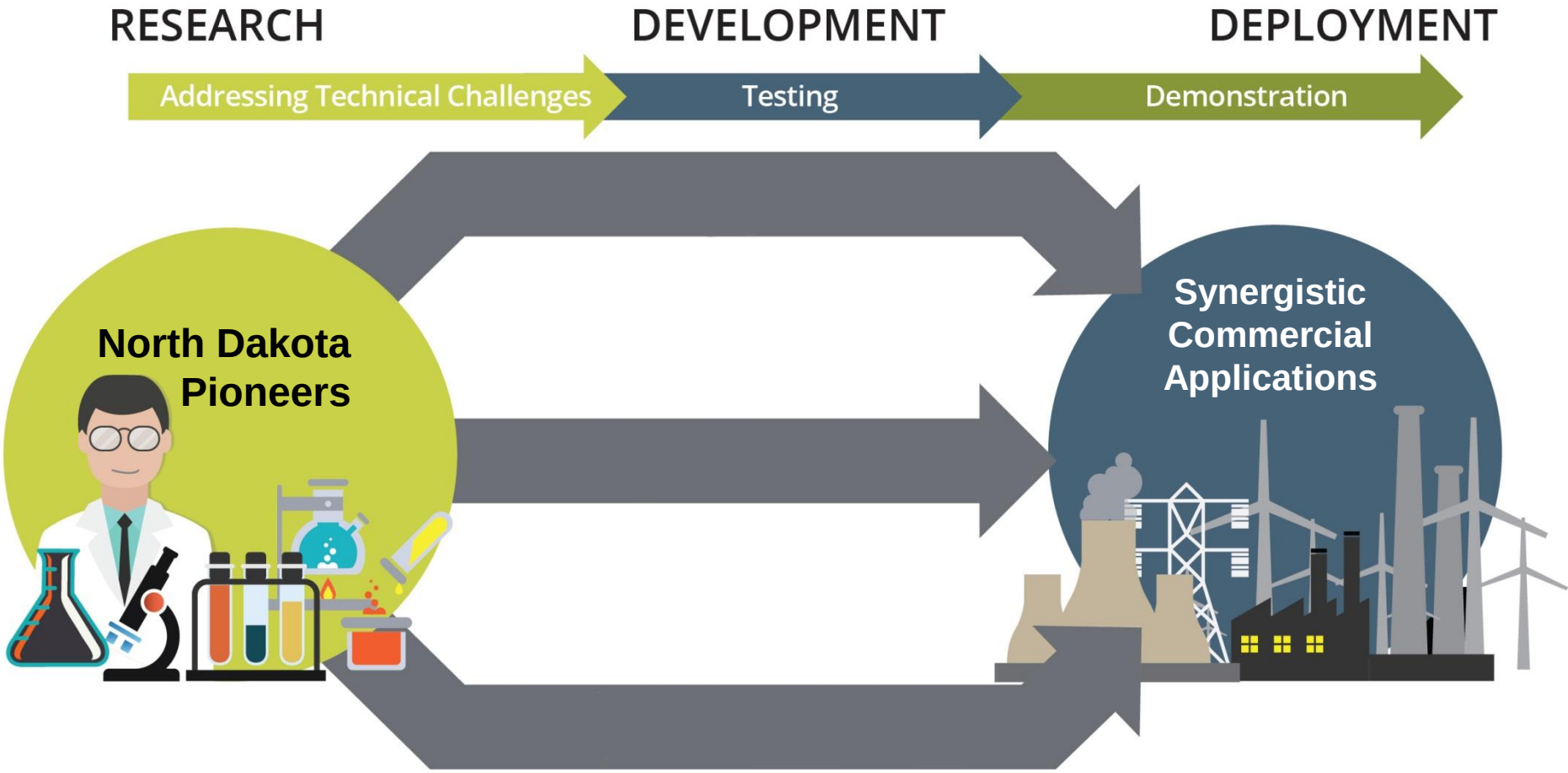
PIONEERING TECHNOLOGY


RESEARCH
DEVELOPMENT
DEPLOYMENT
Addressing Technical Challenges
Testing
Demonstration
North Dakota Pioneers
Synergistic Commercial Applications

WE CHOOSE TO…

"We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept…"

– *John F. Kennedy, September 12, 1962*

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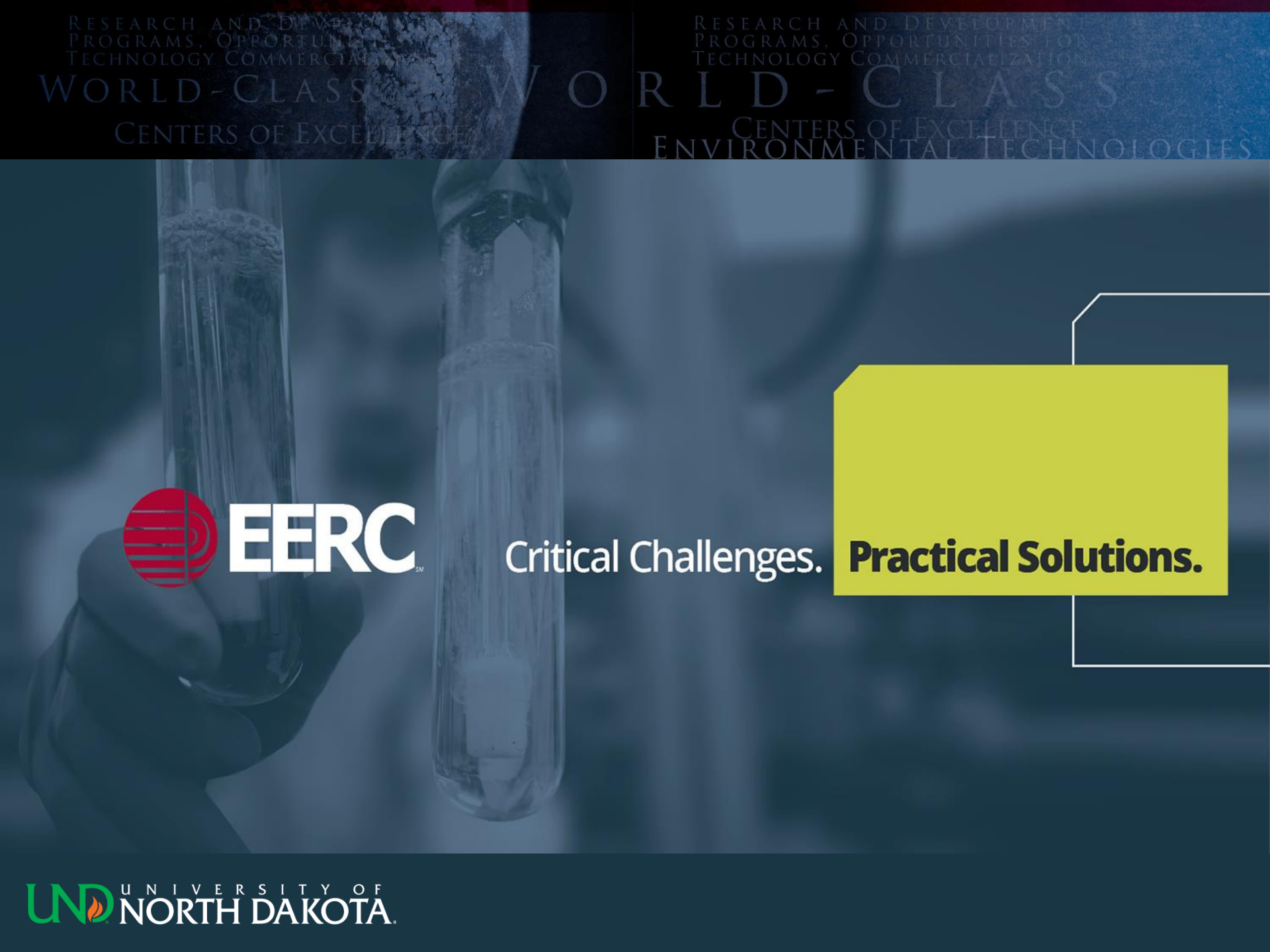
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Critical Challenges.
Practical Solutions.
UNIVERSITY OF NORTH DAKOTA