KENTUCKY INNOVATOR CHALLENGE 2024

UK INNOVATE
UNIVERSITY OF KENTUCKY RESEARCH

Summer Goldman

Chief Operating Officer

Metals Innovation Initiative (MI2)

KENTUCKY INNOVATOR CHALLENGE

Funding Source Introduction

METALS INNOVATION INITIATIVE (MI2)

SUMMER GOLDMAN

Mi2 METALS INNOVATION INITIATIVE

MI2 MISSION

METALS INNOVATION INITIATIVE

Together, making Kentucky the destination for metals innovation.

OPEN | COLLABORATIVE | PRE-COMPETITIVE | DE-RISKED | INNOVATION

Summer Goldman

Chief Operating Officer

Metals Innovation Initiative

- Lead the initiative workgroups including:
  - Talent & Workforce
  - Technology Innovation
  - Sustainability
- As well as:
  - Grants & Funding
  - Program Management

TIME OF PROFOUND CHANGE

Emerging technologies will transform manufacturing

Supply chain reshoring

Persistent talent shortage

New industries need new solutions

Sustainability requirements increasing

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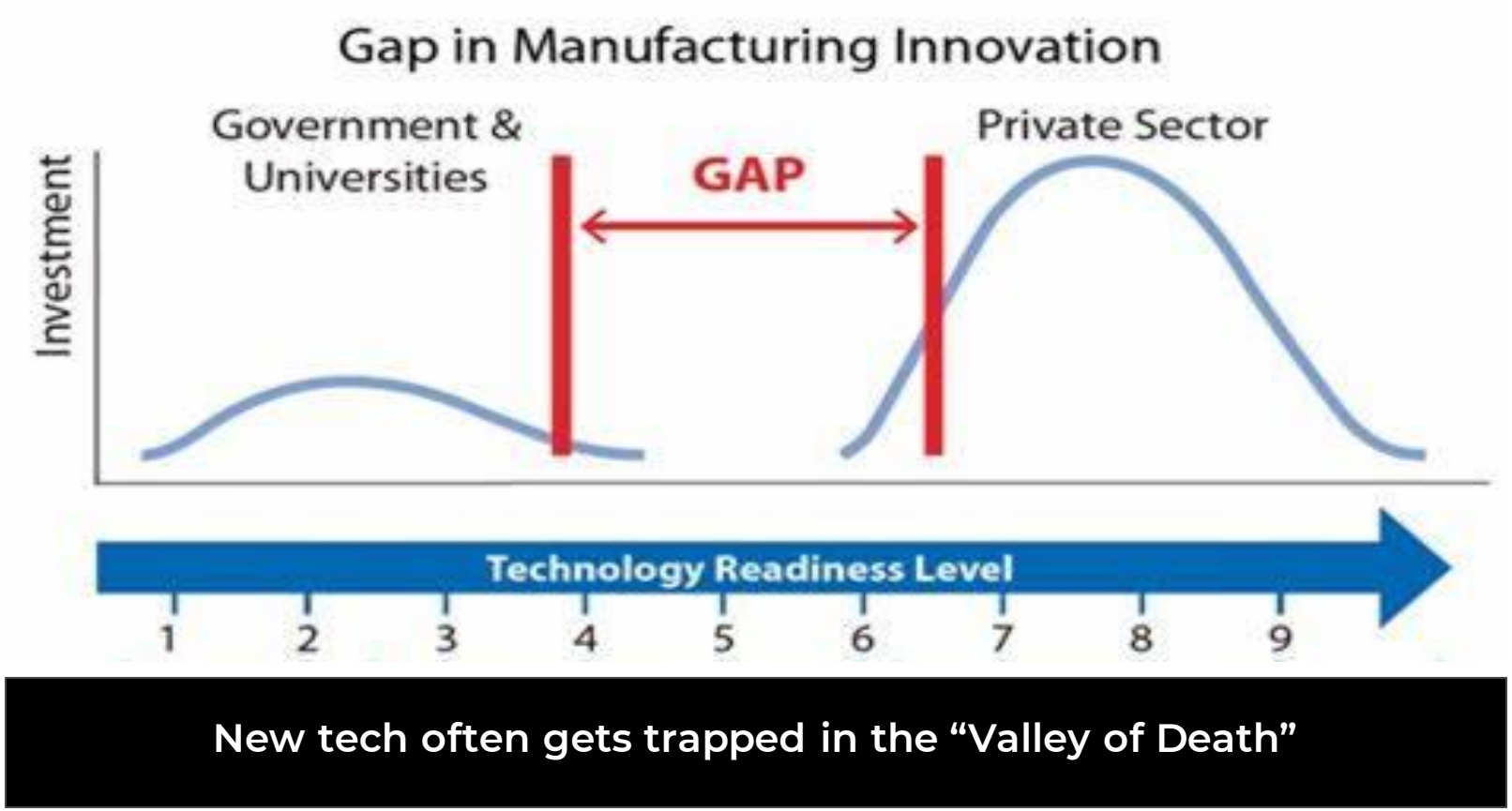
POWER OF **COLLABORATION**

The challenges and opportunities facing the metals industry are bigger than any one company can tackle quickly.

- By working together on pre-competitive challenges, Kentucky's vibrant metals ecosystem can **share the risk of innovation** while **accelerating and expanding the benefits for individual companies.**
- Kentucky's metals sector has grown to become one of the state's most substantial industries, composed of more than **250 facilities across the Commonwealth** and **supporting more than 36,000 full-time jobs.**
- Kentucky is also home to many **universities, colleges, nonprofits, and support organizations** focused on **R&D, workforce development, entrepreneurship, and advocacy.**
- MI2 facilitates collaboration across this ecosystem to help **individual member companies succeed**—and with **strategic partners beyond Kentucky's borders** as well.

PROBLEMS TO OVERCOME THROUGH **INNOVATION**



New tech often gets trapped in the “Valley of Death”

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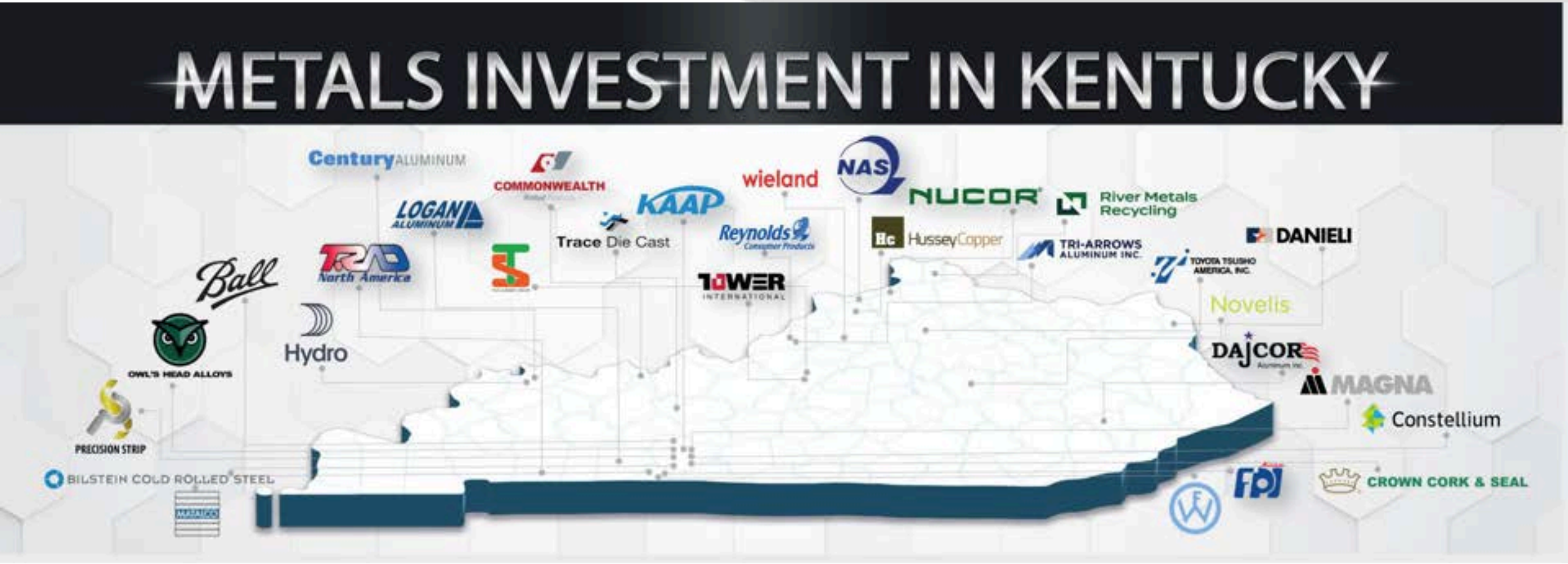
METALS INNOVATION INITIATIVE

KENTUCKY METALS INDUSTRY



STRATEGIC FOCUS AREAS FY 23/24

METALS INNOVATION INITIATIVE

TALENT & WORKFORCE

TECH INNOVATION

SUSTAINABILITY

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MI2 AND FUNDING

Federal funding

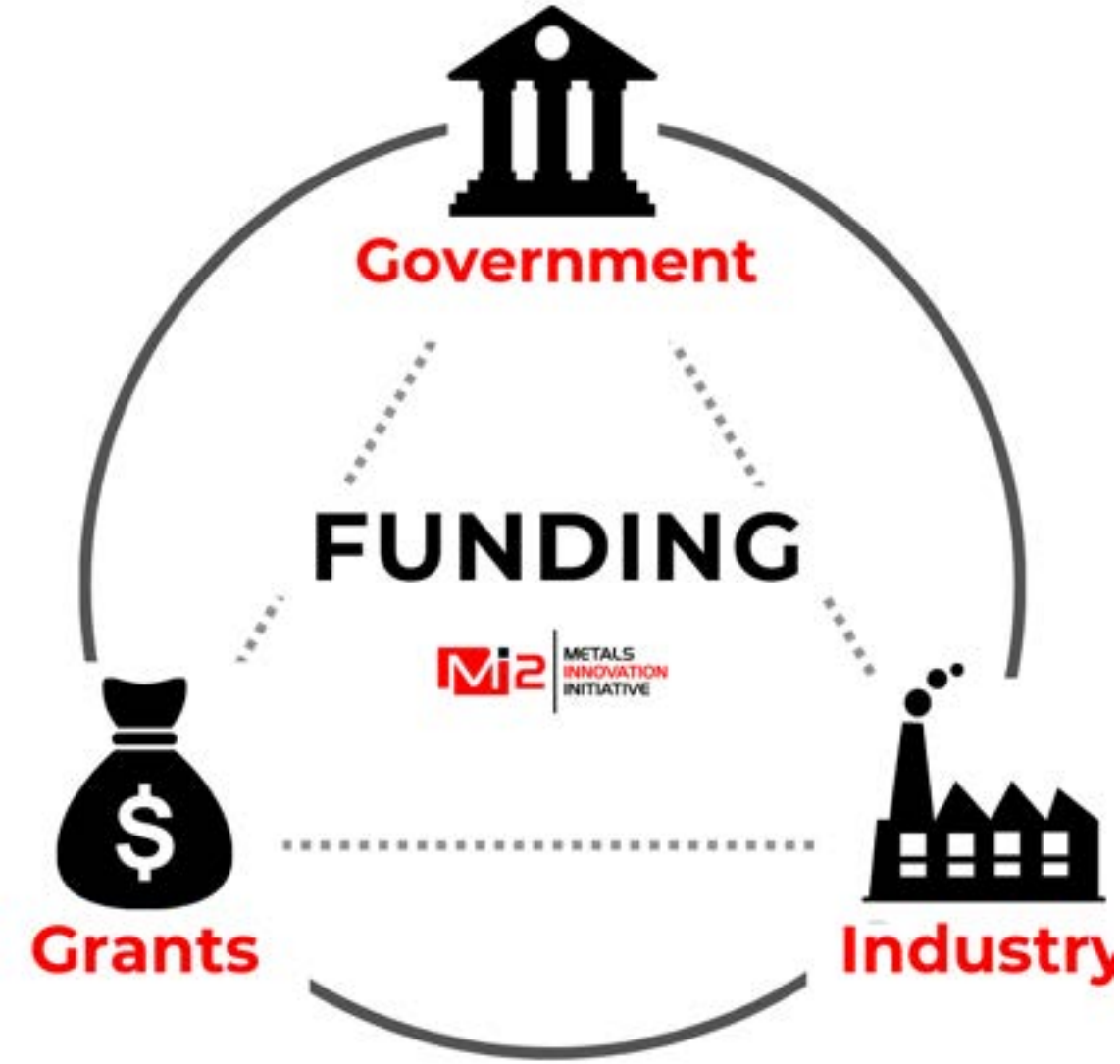
- UK/NSF/Game Change
- UK's GAME Time proposal
- NSF Future Manufacturing/UofL

Grants

- Community Energy Innovation Prize
- Families & Workers Fund/Accelerate KY
- Distressed Area Recompete Pilot

Industry

- Membership dues
- Pilot and project sponsorships



WORKING TOGETHER TO SOLVE THEM

- Federal grant collaborations
- UK's Research Priority Area in Material Science
- Partner on pre-competitive technology with metals industry applications
- Participate in the conference this fall
- Guide innovators to Mi2's work

www.mi2ky.org

METALS INNOVATION INITIATIVE

2413 Nashville Road, Suite 105, P.O. Box C3 Bowling Green, KY 42101

Vijay Kamineni, *Chief Executive Officer*
vijay@mi2ky.org

Summer Goldman, *Chief Operating Officer*
summer.goldman@mi2ky.org

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THANK YOU!

UNIVERSITY OF KENTUCKY RESEARCH

TRACK A: MATERIALS ENABLING THE FUTURE OF KENTUCKY

KENTUCKY INNOVATOR CHALLENGE

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PRESENTERS

Anil Yadav

Vice President, Operations

North American Stainless

Doug Smith

Senior Vice President, Operations

Fischer Homes

Ron Gregorsok

Director, Supply Chain Management

Fischer Homes

Roger England

Vice President and Chief R&D Officer

Valvoline Global Operations

Anil Yadav

Vice President, Operations

North American Stainless

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KENTUCKY INNOVATOR CHALLENGE

MATERIALS ENABLING THE FUTURE OF KENTUCKY

NORTH AMERICAN STAINLESS

ANIL YADAV

"THE ONLY PATH TO FUTURE SUCCESS WITHIN MANUFACTURING IS THROUGH

CONSTANT INNOVATION, ADAPTION TO EMERGING TECHNOLOGIES AND MODERNIZATION."

ABOUT ME

Anil Yadav

MS, Material Science

University of Kentucky

VP Operations

North American Stainless

ACERINOX GROUP

Stainless & High Performance Alloys

13,700
Customers

80+
Countries supplied

20 +
Sales Agents

50 +
Commercial offices

+90
Certifications of quality

25
Service Centers & Warehouses

Presence in 5 continents

NORTH AMERICAN STAINLESS

A member of the **Acerinox Group**, North American Stainless (**NAS**), is the largest fully integrated stainless steel producer in North America.

Producing a wide range of both **flat and long stainless steel products**.

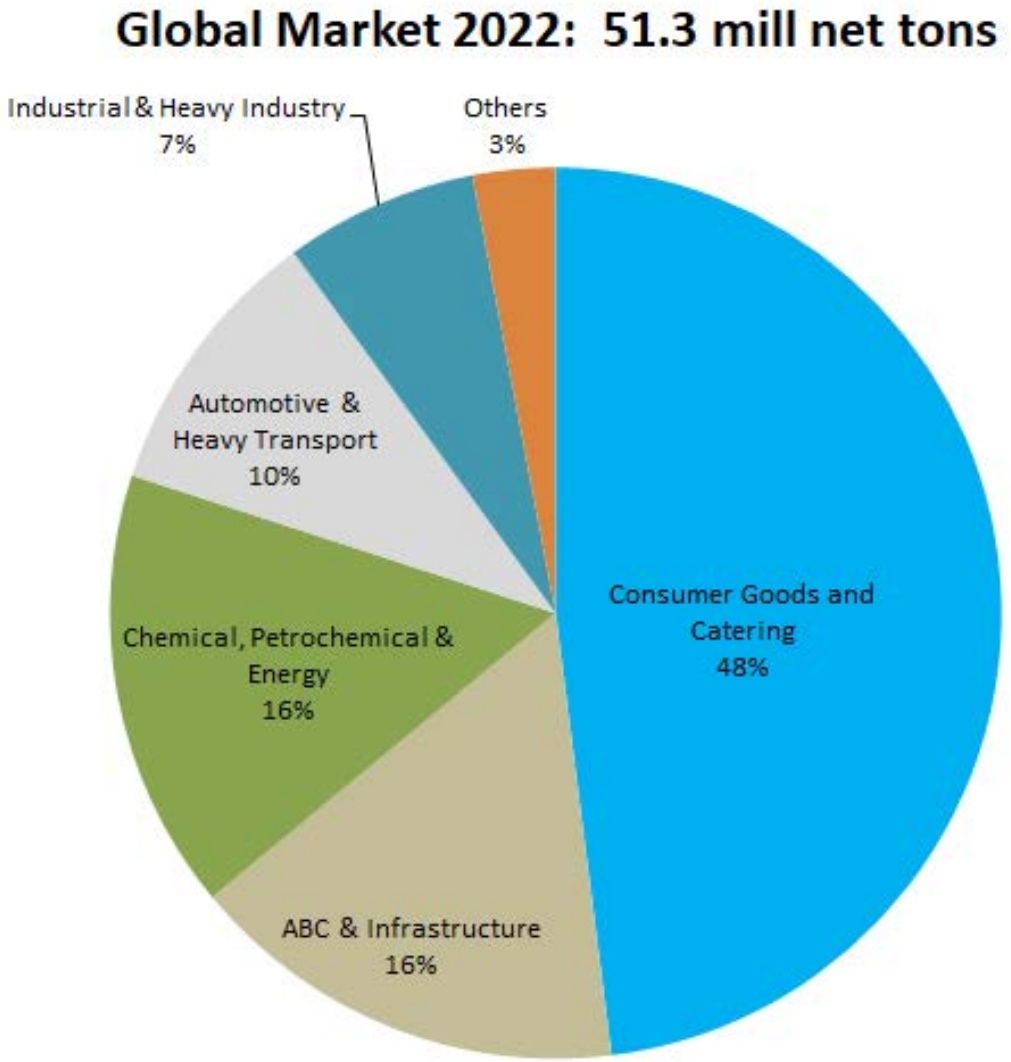
With a highly trained and motivated workforce committed to providing material solutions to our customer's needs and with a vision to lead the way to a new circular economy through the efficient production of stainless steel that respects the environment.

- **One site location** in Kentucky,1600 acres
- **Fully integrated** mill, 3 million sq ft
- Warehouse network in **U.S., Canada and Mexico**
- **Wide range** of flat and long stainless steel products
- **1,600** employees

STAINLESS STEEL

- **Main Components**
  - **Iron,**
  - **Chrome,**
  - **Nickel**
- Depending on the grades up to 18 different alloying elements can be used
- **Raw Materials**
- Most of the components we use come from the **Recycled Scrap,** in some grades **up to 95%** of the total melt correspond to recycled scrap
- Pure Nickel as well as Ferro Chrome and other alloying materials are sourced world wide

STAINLESS STEEL MARKET



APPLICATIONS

Exterior Cladding U.S. Army Museum

Stainless Steel type: T316L

Corrosives Tank Trailers

Stainless Steel type: Duplex 2205

Stainless Tanks for various applications

Outdoor Wood Burning Stoves

Stainless Steel type: T409

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NORTH AMERICAN STAINLESS

PROCESSES

MELTING : 1.4 MILLION TONS

HOT ROLLING : 1.2 MILLION TONS

COLD ROLLING : 936,000 TONS

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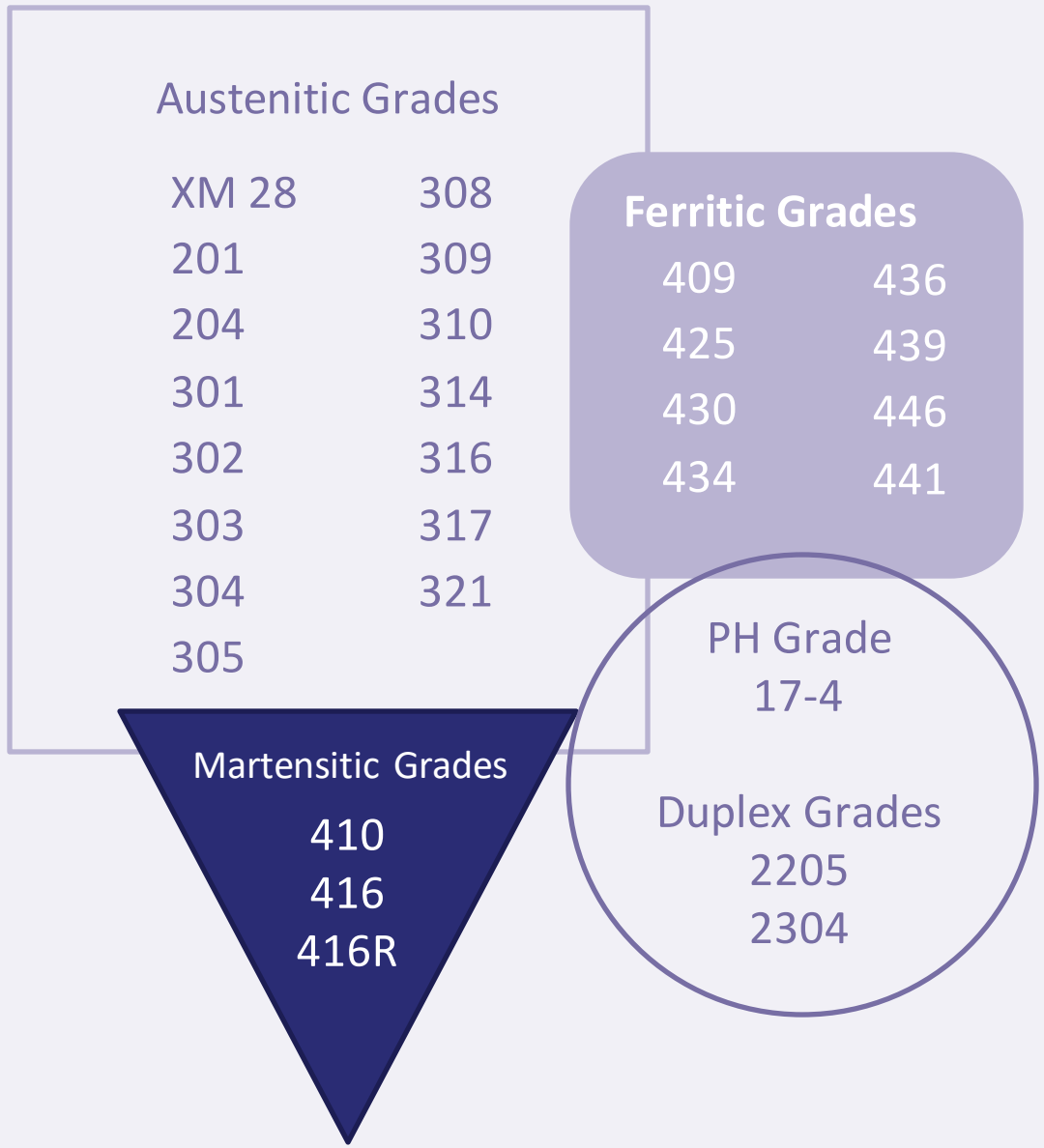
NORTH AMERICAN STAINLESS

GRADES

- ✓ We produce a full range of stainless steel grades including grades in all major stainless steel families

- ✓ Future grades including super alloy stainless to be included in our range based on market demand

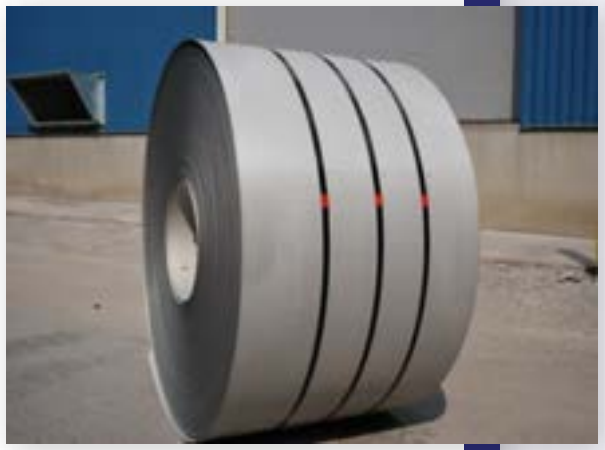


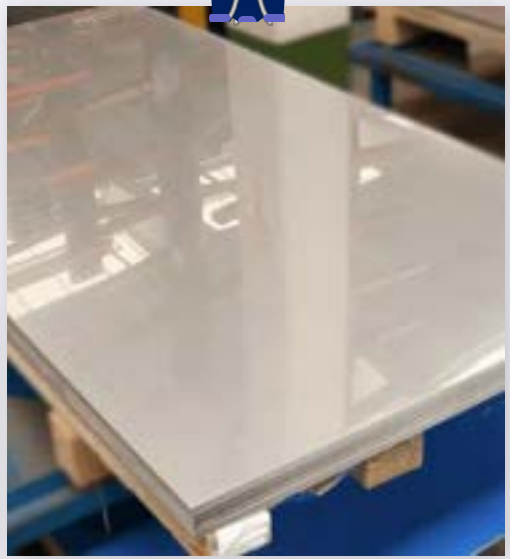
PRODUCTS

As the only U.S. Producer that melts both flat and long products, we are able to offer to the market a one stop shop option for most of the stainless steel products that our customers need.

Customers

- Distribution and End-users
- Wide variety of applications;
  - Cosmetic applications like Appliance and Kitchenware
  - Corrosive environments like Chemical and Petroleum processing equipment
  - High Temperature uses like Automotive Exhausts
  - Reinforcing Bar for Construction & Bridges





FUTURE GROWTH

Capital Expansion:$244 million

- **Increase of +20% capacity** to keep up with growing demand

Acquisition of Haynes International

- A leading developer, manufacturer, and marketer of technologically advanced **high-performance alloys**

Mission

"Create **SOLUTIONS** for each application, thus contributing to the progress and quality of life of a sustainable society"

Vision

- **Leaders** for present and future needs
- **Widest choice** of materials, solutions and services
- **Customer** at the center of our business
- Essential part of the transition towards a new **circular and green economy**

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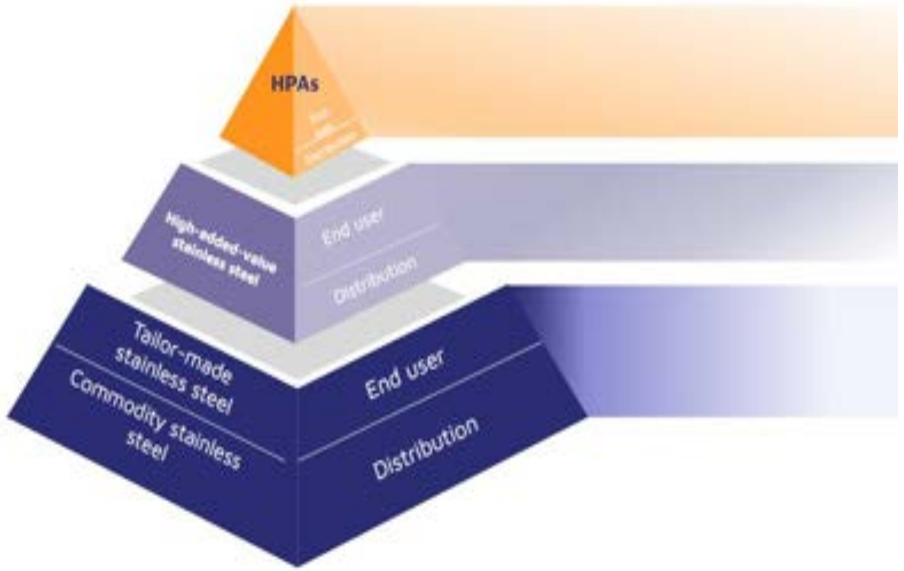
PROBLEMS TO OVERCOME THROUGH INNOVATION

- Increasing the **Sustainability** of our products
  - Beneficial Uses for our by-products
  - Reduction of our CO2 footprint through optimized energy use, renewable energy sources, and modernized equipment
- Leveraging computational power to drive our **Digital Transformation**
  - Machine Learning to predict machine failure or quality issues
  - Digital twin modeling of all critical processes
  - Advanced sensorization to detect abnormal conditions
  - Used of emerging technologies (LLM) for operations improvement
  - General use of Industry 4.0 initiatives for OEE improvement
- Engaging in development of **New Materials** with enhanced properties
  - New alloys for demanding applications
  - Enhanced properties for current customers



WORKING TOGETHER

- Acerinox group Research & Development
- Partnership with University Research
- University collaboration for federal grant opportunities
- Student sponsorship through internships and co-op programs
- Hosting Stainless Steel workshop for students
- Career center engagement for recruiting prospective employees (Career Fairs, Interview Sessions)

KENTUCKY INNOVATOR CHALLENGE

CONTACT US

HTTPS://WWW.NORTHAMERICANSTAINLESR&D:

DANIEL HARGETT, DHARGETT@NAS.US
SUSTAINABILITY: NAMRATA GANDHI, NG3651@NAS.US
HR: LAUREN TOOMBS, LT3504@NAS.USS.COM

THANK YOU!

UK INNOVATE
UNIVERSITY OF KENTUCKY RESEARCH

OFFICIAL One UK PARTNER

Doug Smith

Senior Vice President, Operations

Fischer Homes

Ron Gregorsok

Director, Supply Chain Management

Fischer Homes

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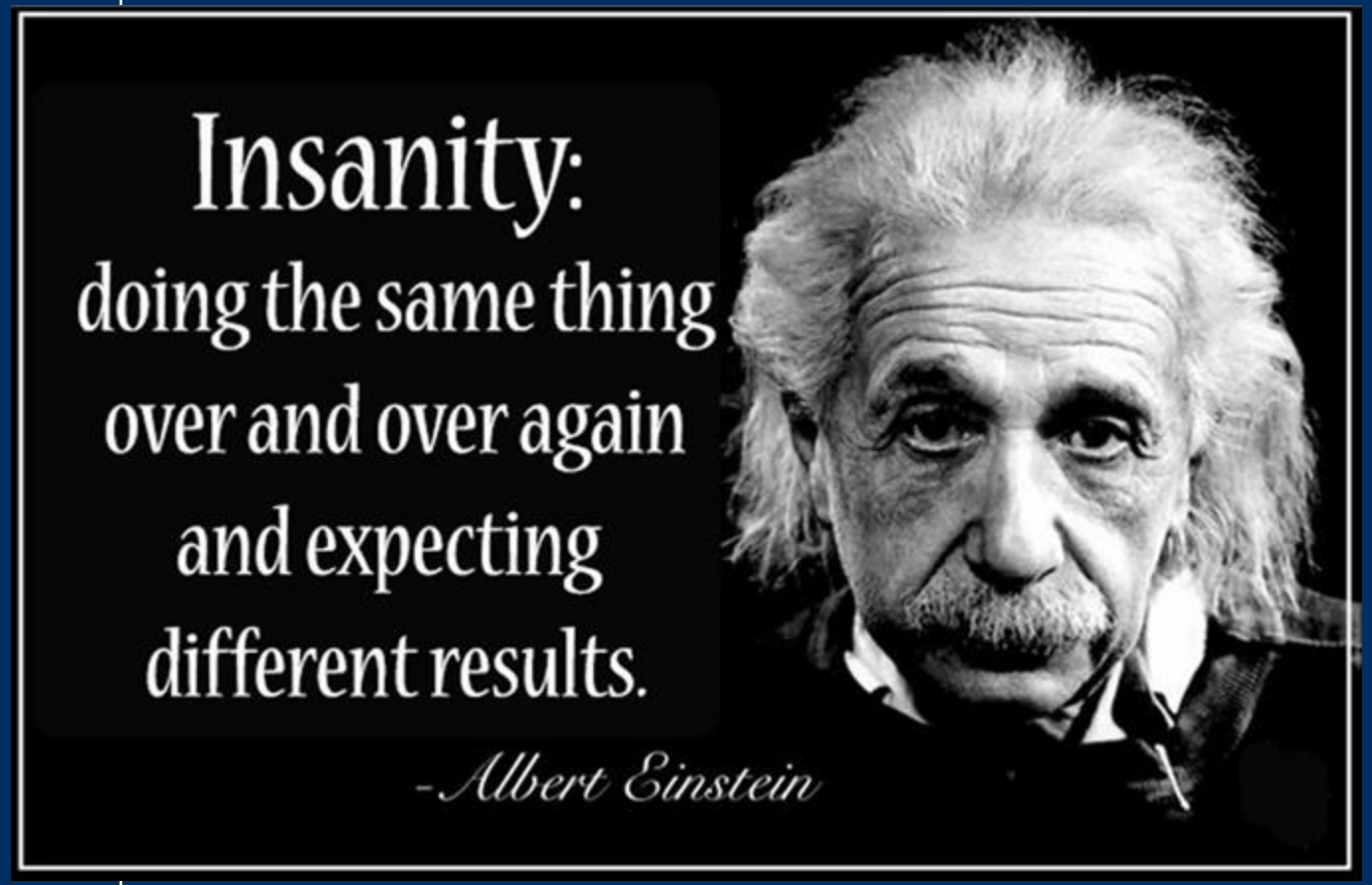
INNOVATOR
CHALLENGE

"Materials Enabling the Future of Kentucky"

PRODUCING TOMORROWS HOMES

DOUG SMITH &
RON GREGORSOK

FISCHER HOMES
FH



Today Material & Labor shortages are crippling the housing industry, destroying efficiencies and driving chaos throughout the process, it's Insane.

Albert Einstein had a vision of the modern-day housing industry when he muttered this bit of wisdom.

ABOUT ME

Doug Smith

SR VP Operations

Fischer Homes

Responsible for leading Operations across the enterprise at Fischer Homes

- Architectural Design & Engineering
- Construction Services
  - BIM Modeling
- Construction Administration
- Internal Operations
- Procurement & Supply Chain

A 40 year veteran of the Homebuilding Industry

- 9 years working with Fischer Homes

A passion for the industry and the critical need for innovation and progressive industry change.

ABOUT ME

Ron Gregorsok

Director of Supply Chain

Fischer Homes

Responsible for leading the Supply Chain organization at Fischer Homes

- Procurement
- Innovation
- New Product Development

20 years experience in Senior Leadership Roles across the Supply Chain space in multiple industries

Experience with companies like:

- Amerisourcebergen (now Cencora),
- Essilor Luxottica,
- Johnson & Johnson.

Graduated from the University of Dayton with a degree in Mechanical Engineering a

Prior service in the Military as a captian in the U.S. Army.

OUR BUSINESS

LOCATION(S)

Fischer Homes has more than 200 new home communities throughout Kentucky, Ohio, Indiana, Georgia, Florida, Missouri and Florida

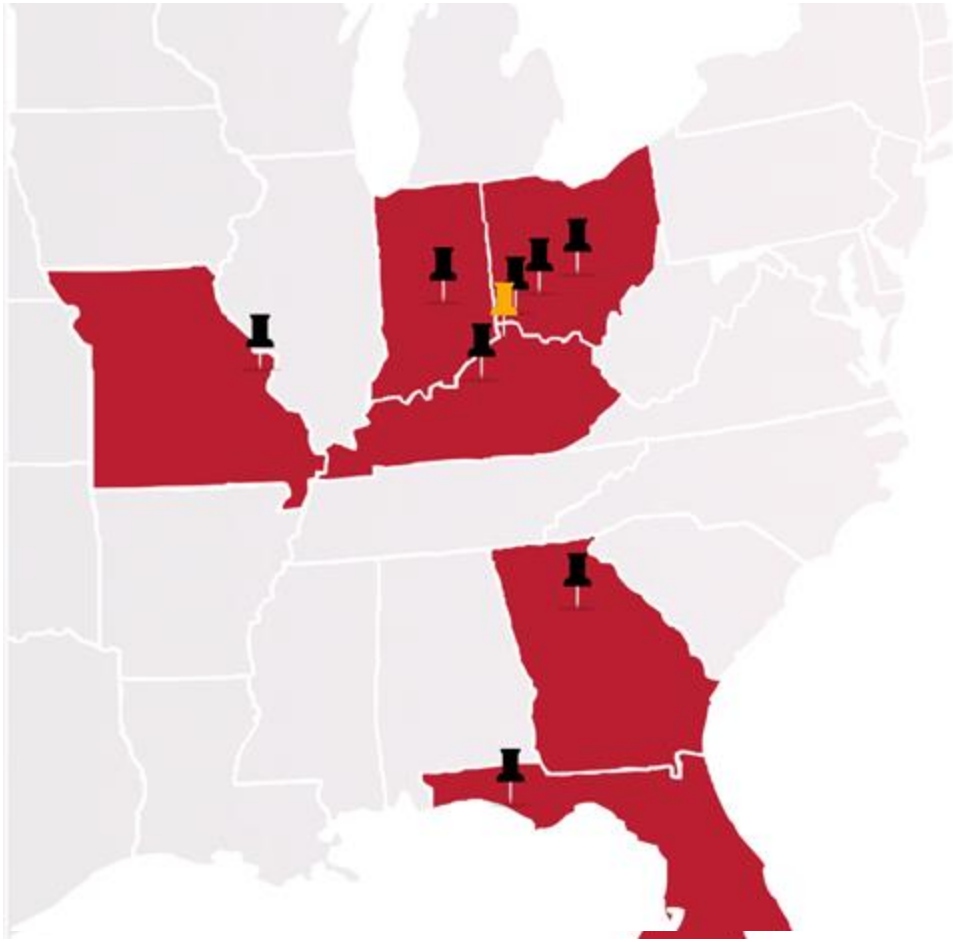
WHAT WE DO

Founded in 1980, Fischer Homes has grown to build over 38,000 homes and employs 700 Associates across 9 markets. We are recognized as the 30th largest builder (11th largest privately-held builder) in the U.S.

ABOUT OUR CUSTOMERS

Our beautifully designed homes offer choices for people in all stages of life and range in price from the $200s to over $1 million.

Location Map



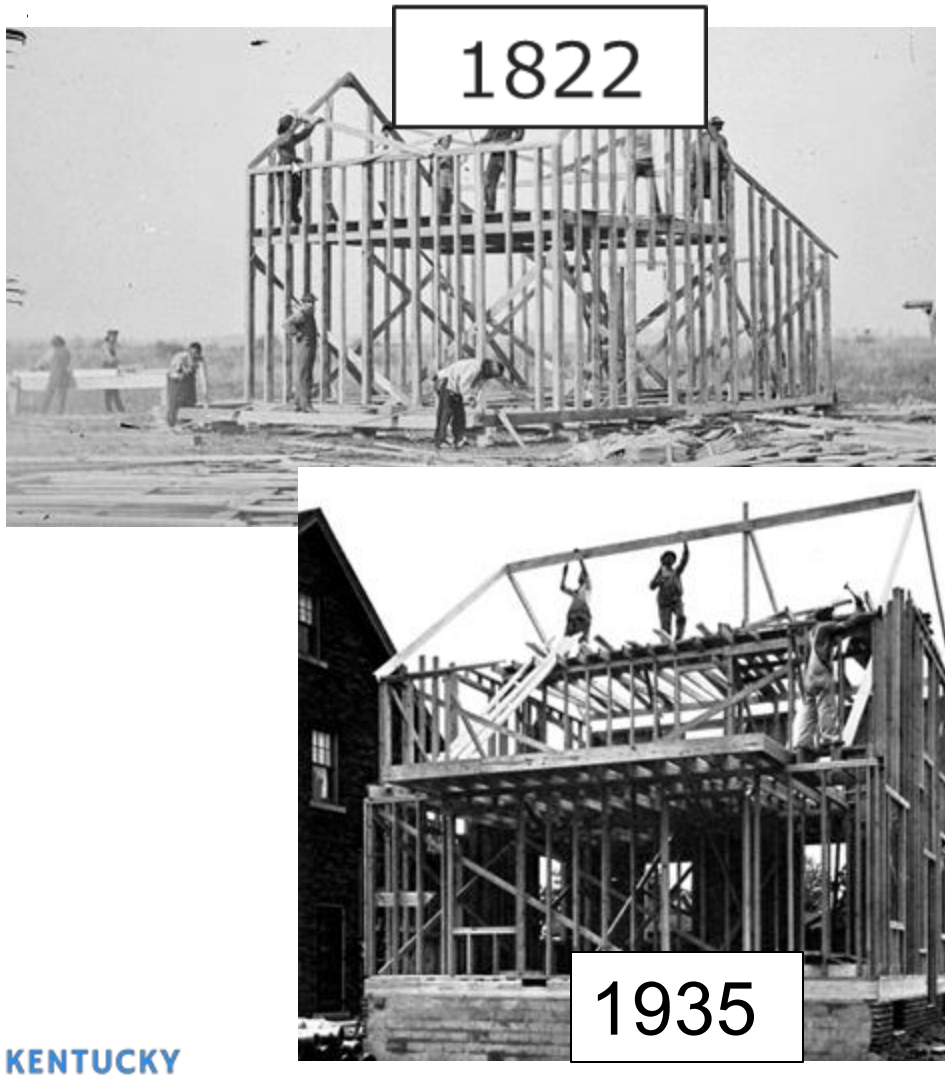
MORE ABOUT OUR BUSINESS

Henry and Elaine Fischer founded Fischer Homes in Northern Kentucky with the philosophy of offering the best total new home solution. “Promise only what you can deliver and deliver what you promise” - Henry Fischer

Our Vision

Creators of the best total new home solution, builders of an exceptional customer experience.

PROBLEMS TO OVERCOME THROUGH INNOVATION



Not much has changed in 100 years! Any question why the Industry seems insane?

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PROBLEMS TO OVERCOME THROUGH INNOVATION

Materials Utilization / Shift

- Alternate Foundations - Concrete – pre-cast
- Structure - Steel in lieu of wood
- Sheathing – Composite / Wood / Fiber

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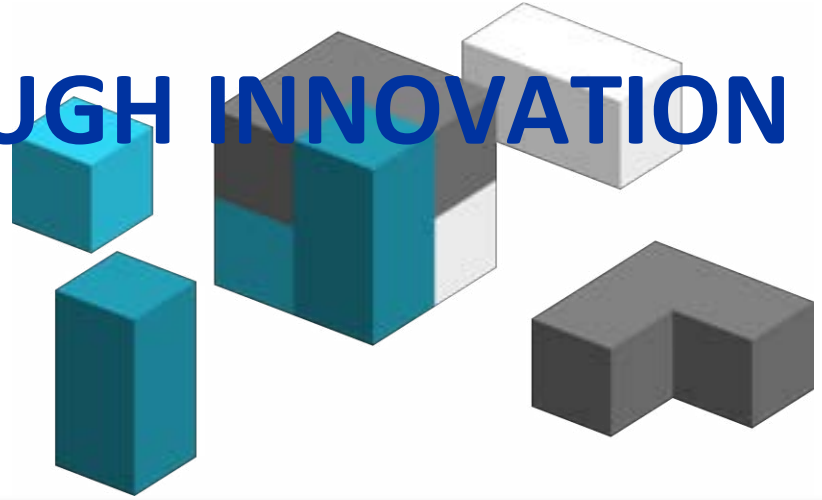
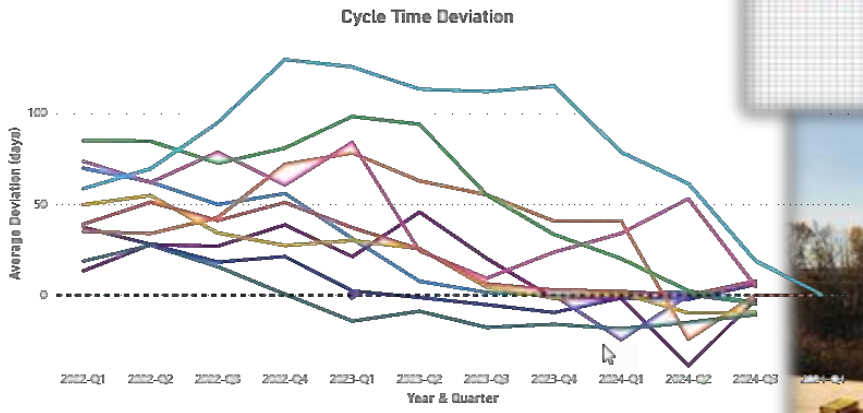
PROBLEMS TO OVERCOME THROUGH INNOVATION



Skilled labor shortage (On-site / Off-site)

- Componentization – Floor cassettes, roof cassettes, wall panels, etc.
- Modularization – Pre-assembled mechanicals
- Capacity – Doing more with less
- Cycle time reductions
- Maximize Trade effectiveness



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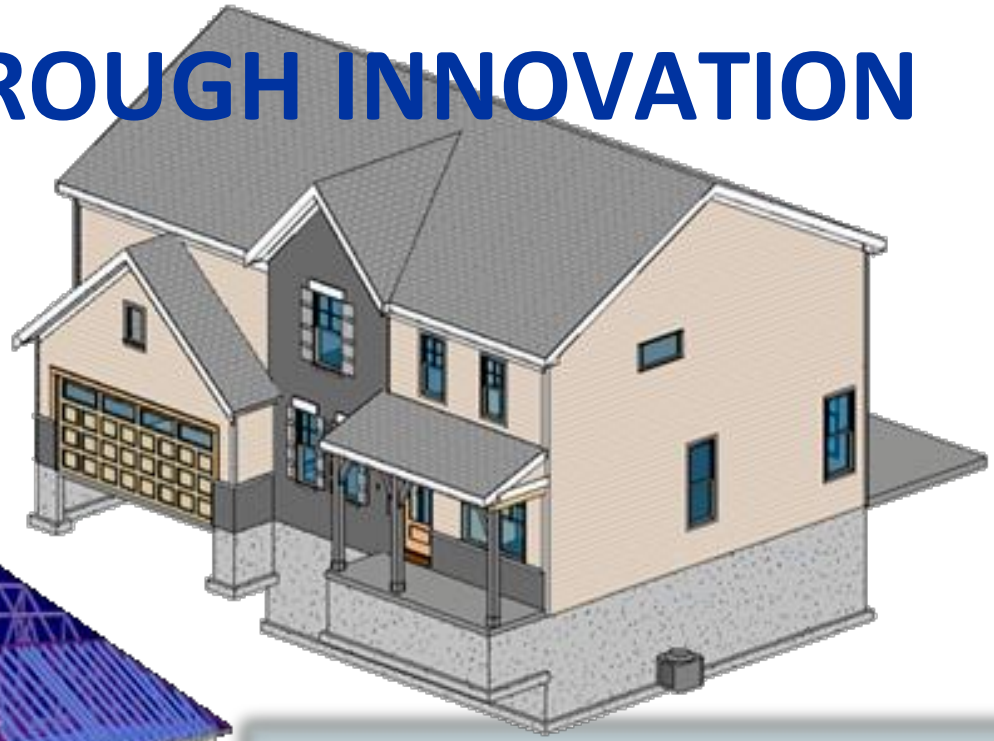
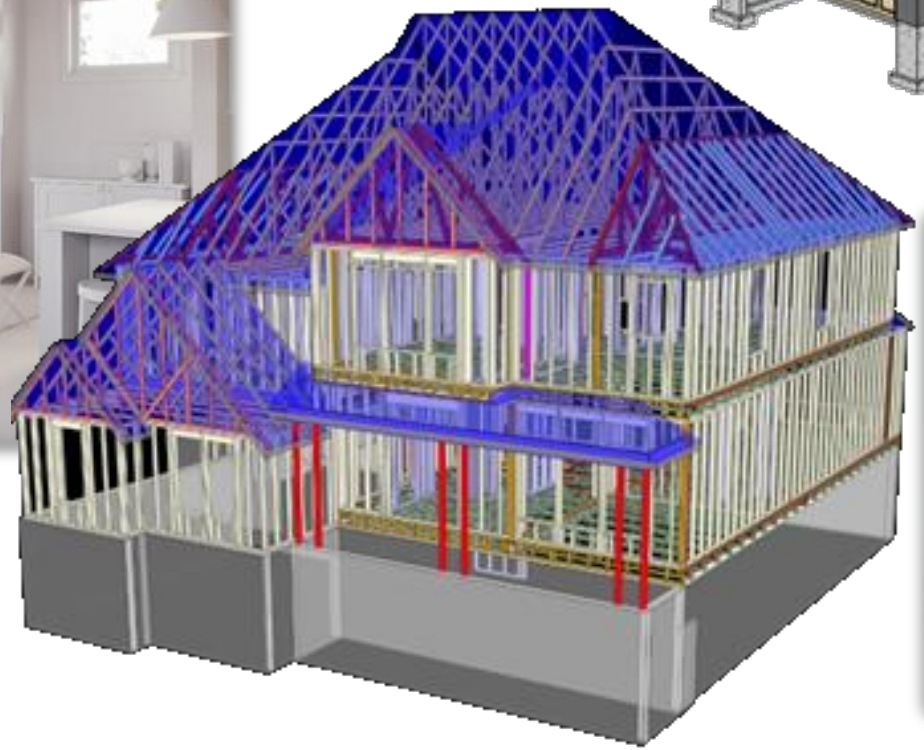
PROBLEMS TO OVERCOME THROUGH INNOVATION

Project visualization (Efficient Manufacturing)

- BIM Modeling – visualization
- Virtual modeling





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WORKING TOGETHER TO SOLVE THEM

- Time study analysis
- Total Cost of Ownership analysis
- Material analysis (engineering / Cost / Supply)
  - Strength trade-off
  - Laboratory testing of materials/components
- Technology exploration
- Assistance with recruiting strategies for trades

FOLLOW-UP ENGAGEMENT CONTACT

Doug Smith

Ron Gregorsok

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KENTUCKY
INNOVATOR
CHALLENGE

FISCHER HOMES

THANK YOU!

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Vice President and Chief
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REINVENTING THE WAY FORWARD

Track: Materials Enabling the Future of Kentucky

DR. ROGER D. ENGLAND

Valvoline™ Global

PROSPERITY MAKES FRIENDS, ADVERSITY TRIES THEM

- Publilius Syrus (1st Century Latin Writer)

ABOUT ME

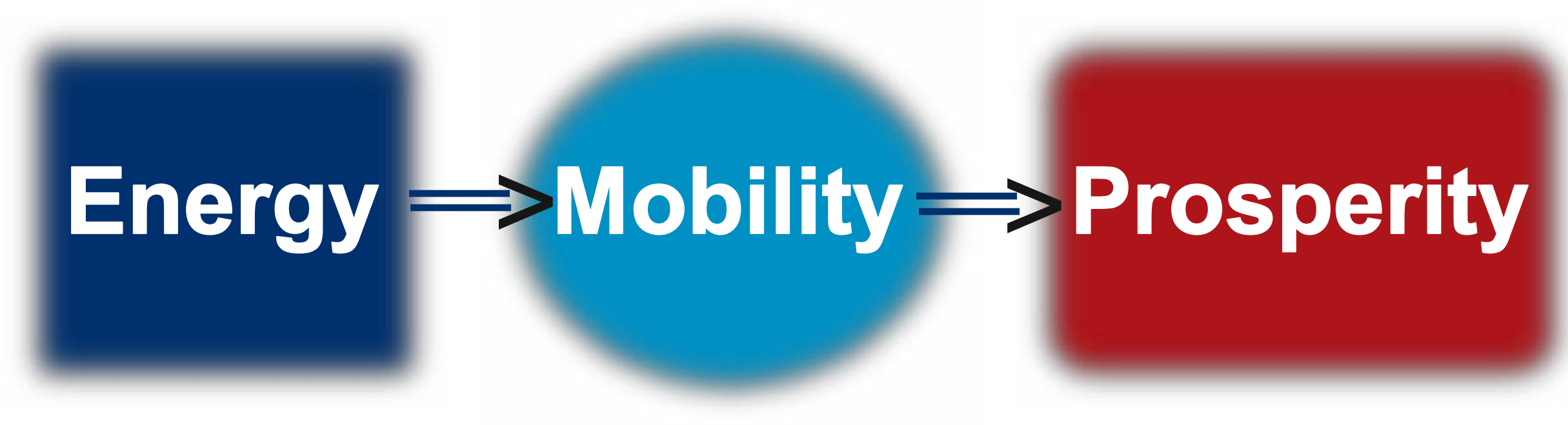
Dr. Roger Dale England

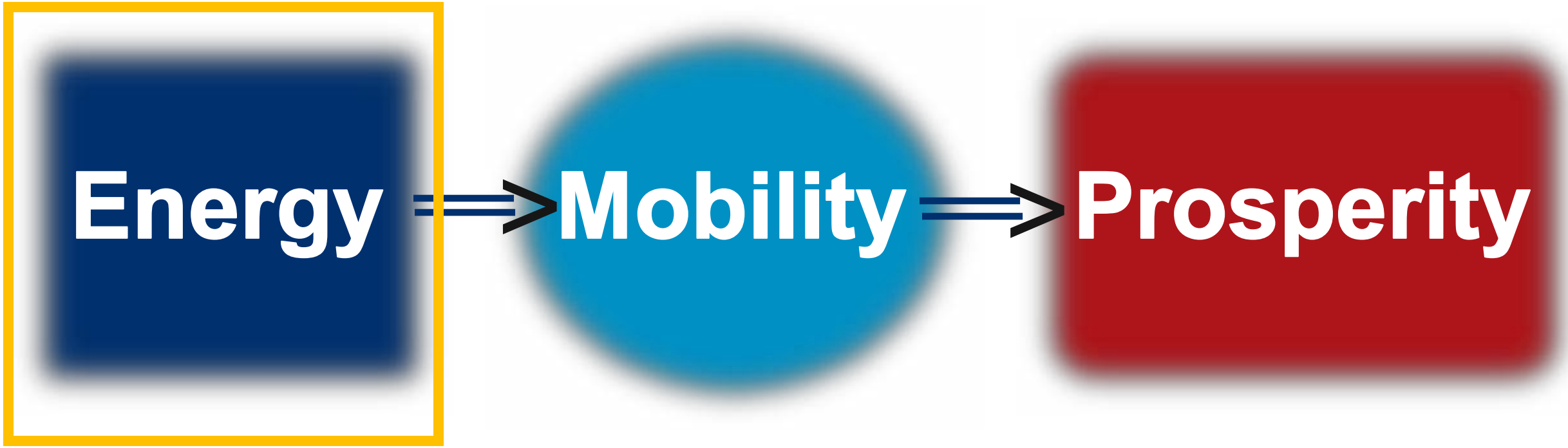
Chief R&D Officer

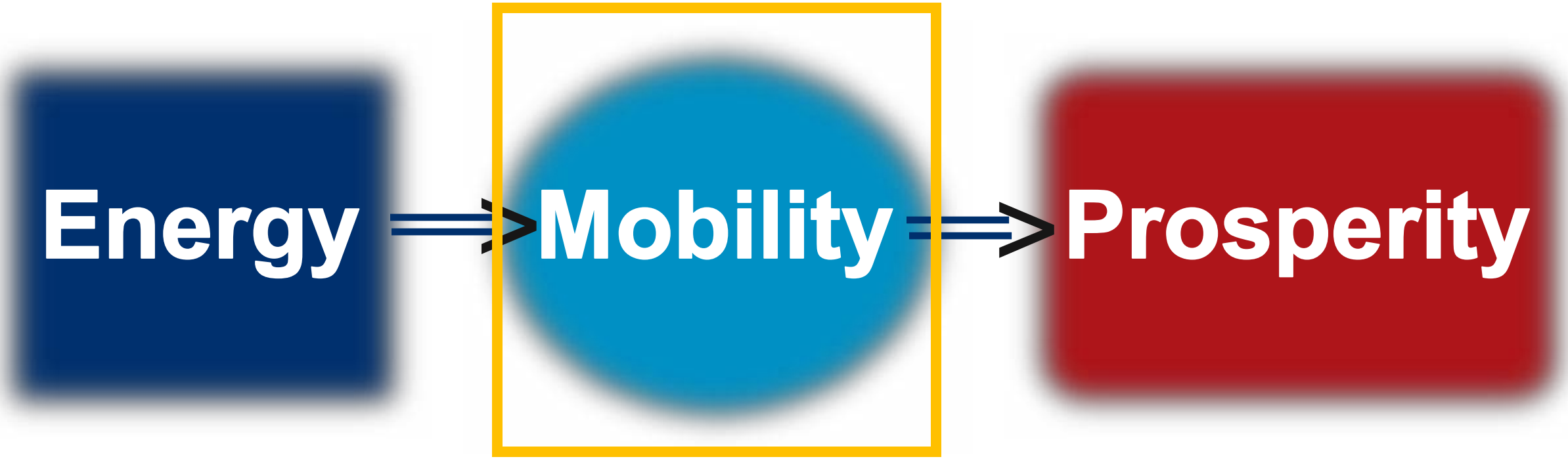
Valvoline Global Operations

- Joined Valvoline in 2017
- Previously with Cummins R&D
- PhD in Mechanical Engineering
  - Florida State University
- MS in Ferrous Metallurgy
  - University of Cincinnati
- BS in Mechanical Engineering
  - Purdue University
- Six Sigma Black Belt
- 17 US Patents
- Oak Ridge National Laboratory Fellow Award Winner
- Auto Racer, Amateur Physicist & Poppy

Our Fundamental Belief




Energy
Mobility
Prosperity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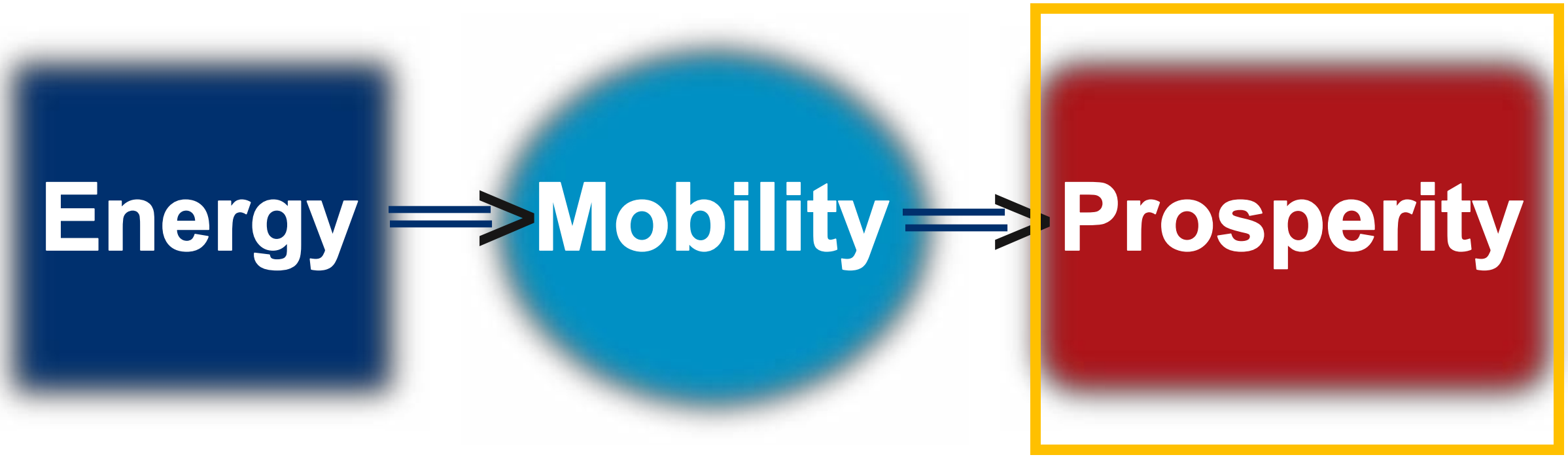
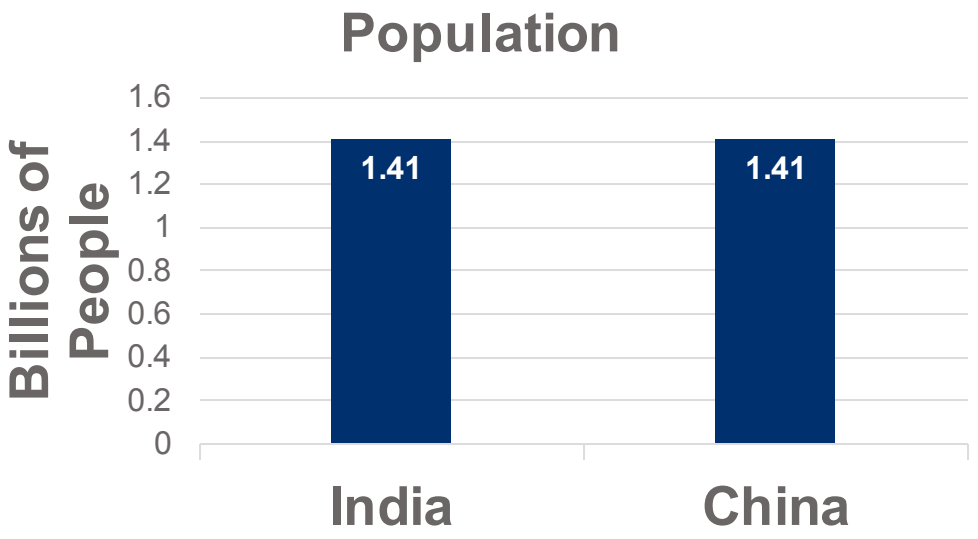
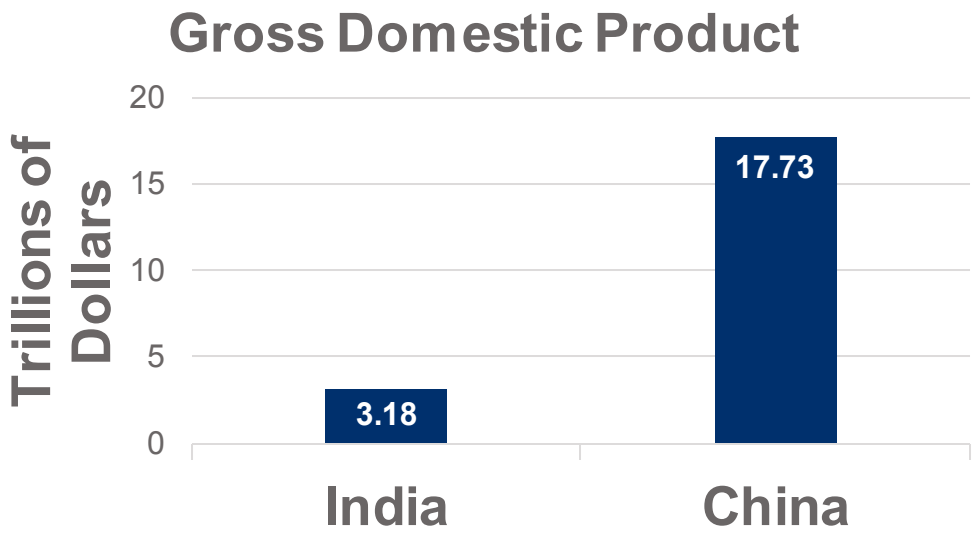

Energy
Mobility
Prosperity

We Must Do This Without Damaging the Environment

A Real-Life Example:





Source: World Bank 2021

Image Source

India
72nd in Road Connectivity

China
10th in Road Connectivity

Image Source

Source: WEF Global Competitiveness 2019 Report

Our Role in Mobility

Image Source

Image Source

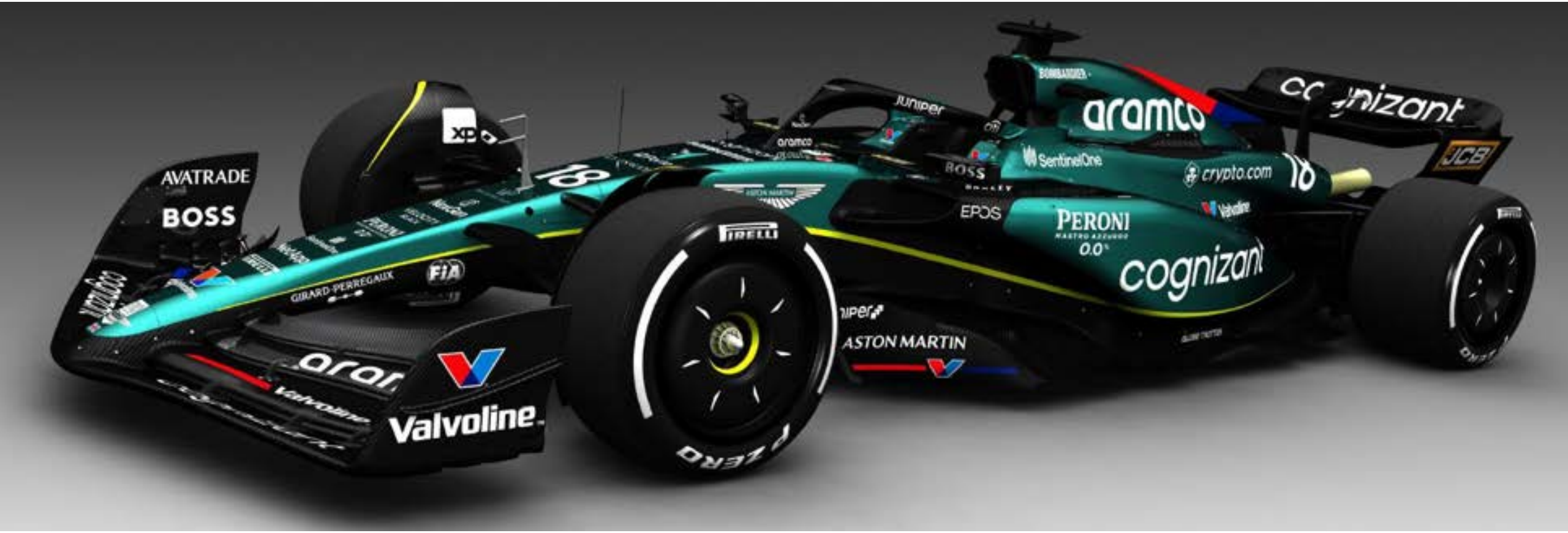
Image Source

Internal Combustion Engines | **Batteries** | **External Combustion Engines**

All Require Management of Friction & Heat

Leading in Technology

We have introduced our Kentucky based technology into F1, the worlds most advanced vehicles

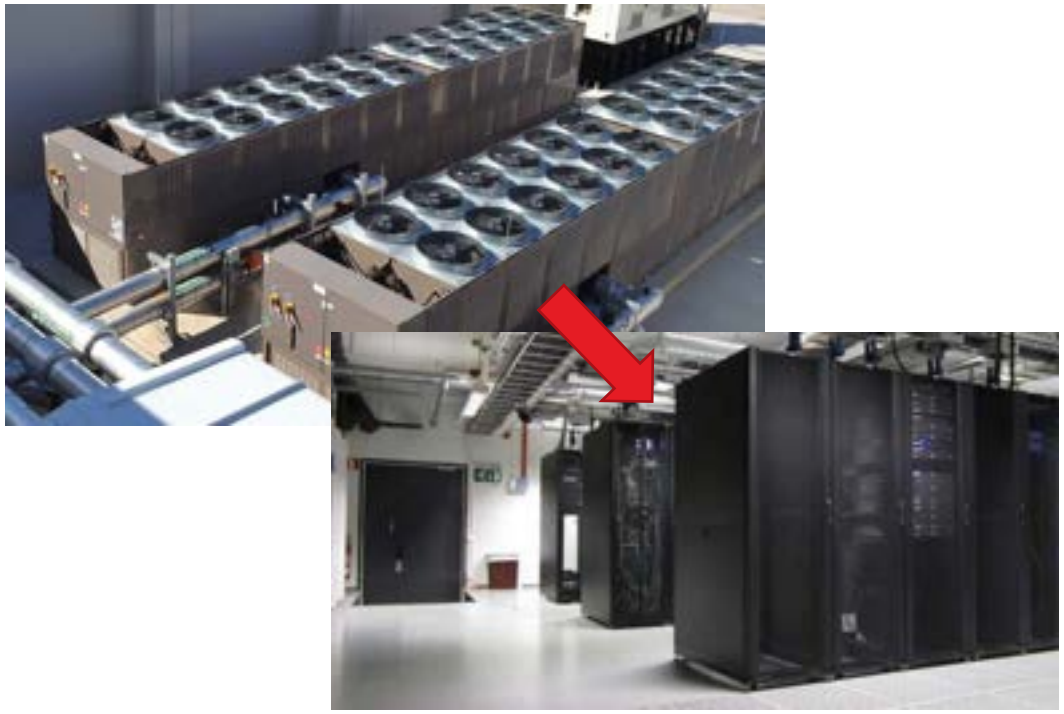


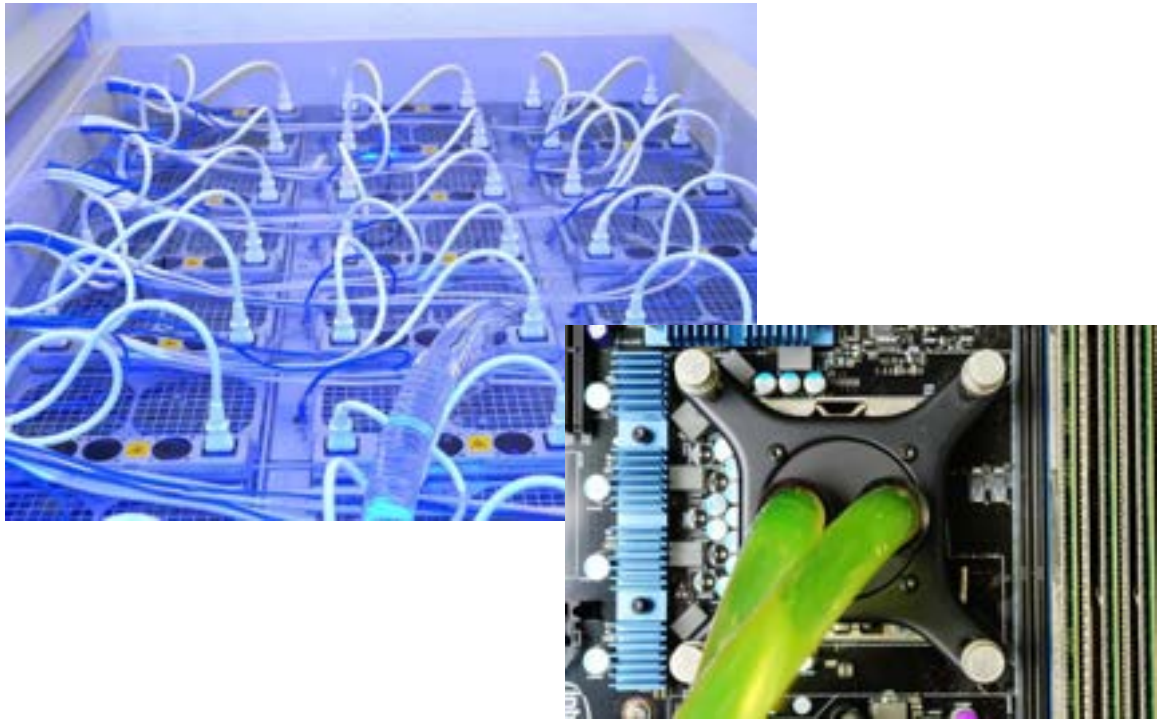
Increasing Lifespan

- Critical parts of the engine begin building up harmful deposits that are nearly impossible to reverse – until now.
- First and only motor oil that prevents formation and restores pistons to factory clean

Efficient Operation

Data Centers consume 3% of the World's Electricity[1]





- With our hardware partners, Valvoline heat transfer fluids can keep chips cool while reducing power consumption by up to 90%
- Can reduce or eliminate the need for noisy, failure-prone fans

[1] – Data Center Knowledge

Serving Kentucky

- Enables full carbon capture in coal-refining and various combustion processes.

Enabling Prosperity for Kentucky through Efficient Energy & Mobility

Valvoline™

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