

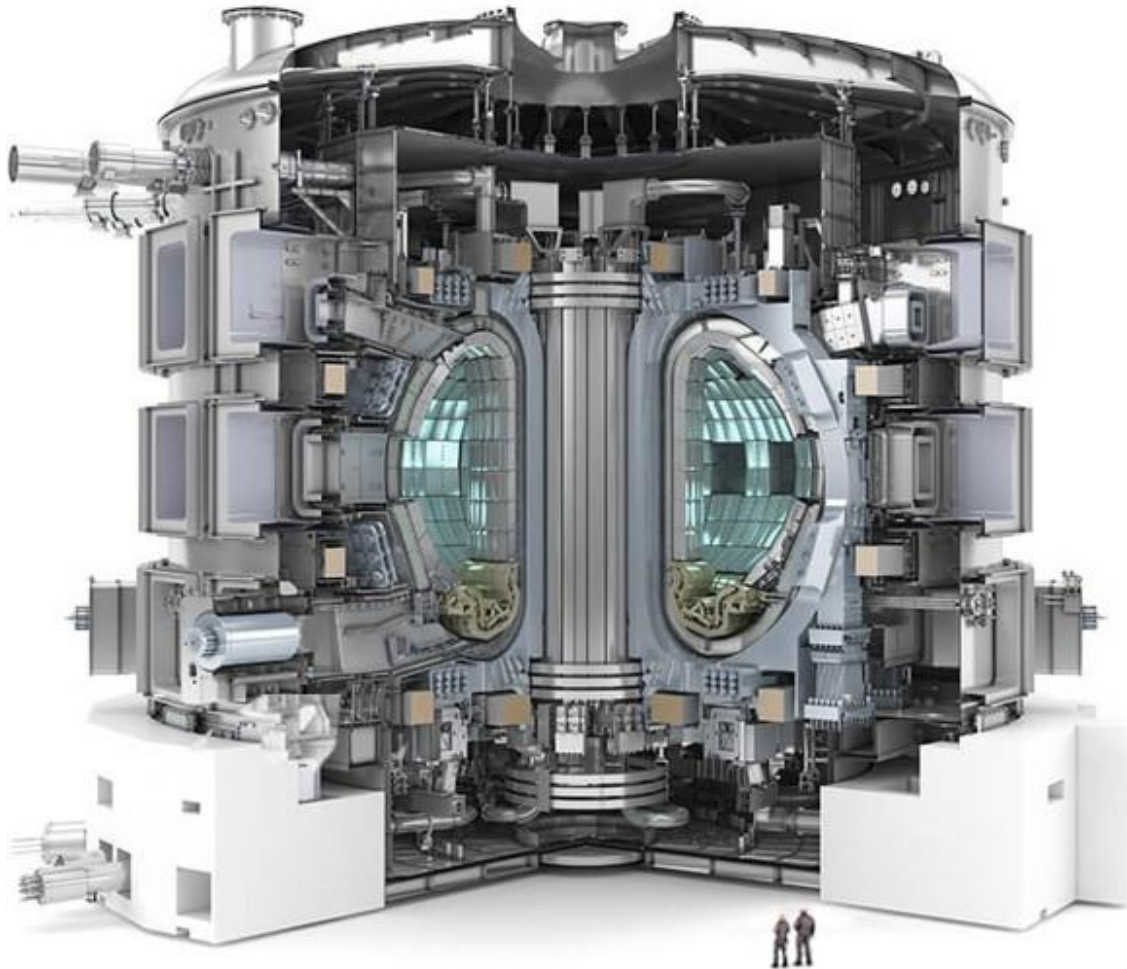


# MARIETTA PROJECT

**MAY 2024**



# EUROPEAN FUSION LEADERSHIP



## Technological Leadership:

- America has ceded its leadership to Europe and China
- Germany is emerging as a new Fusion leader building on the experience of ITER
- €18-22 billion in total investments

ITER  
megaproject,  
HQ, France

## The US:

- US is issuing \$20 billion a year in subsidies to fossil fuel companies that do nothing for economic growth

**One year of US subsidies to fossil fuels is more than the ENTIRE budget of ITER**

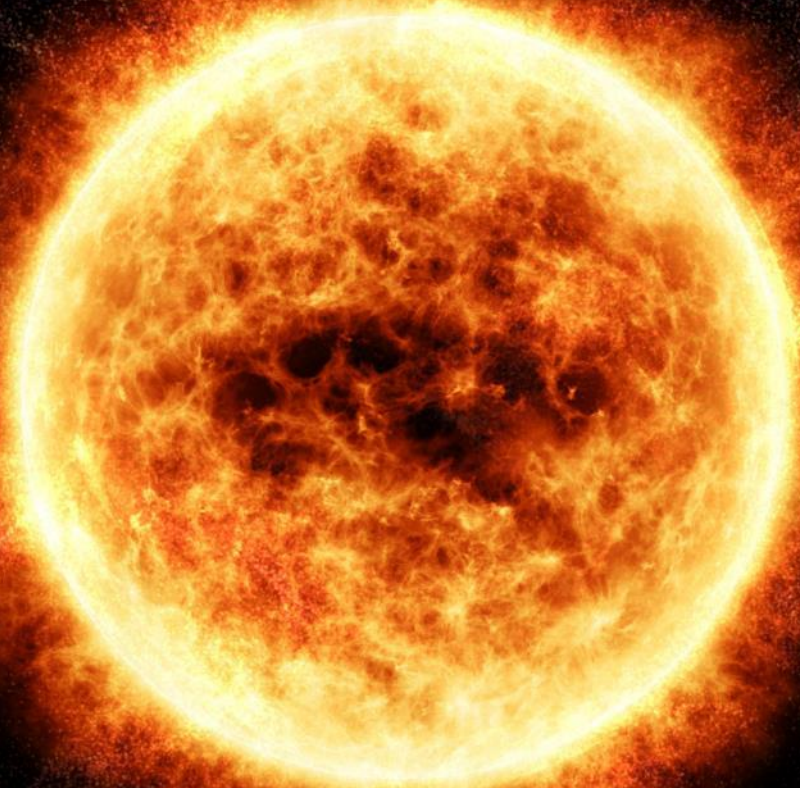


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## WHY FUSION?

One gram of fusion fuel yields as much energy as 11-13 tons of oil or coal

1.5 train cars (200 tons) of fusion fuel = 1 year of electricity for the entire USA



### Fusion technology:

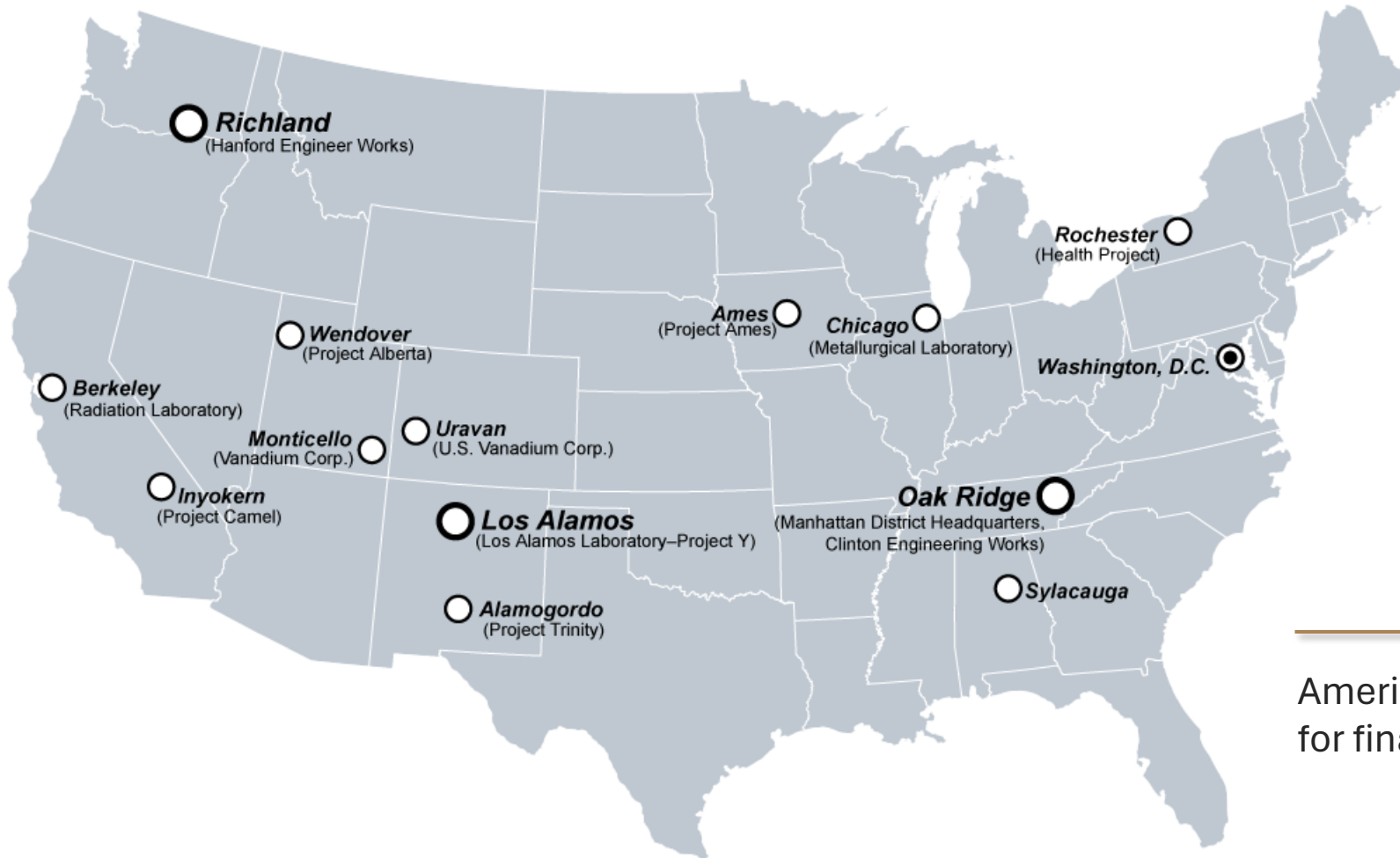
- Inexhaustible source of energy
- Environmentally clean
- Intrinsically safe
- Stable and reliable fuel source
- Byproduct (helium) is a valuable commodity
- Unlimited and **practically free** energy

***THE POWER OF THE SUN IN OUR HANDS***



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# THE MANHATTAN PROJECT



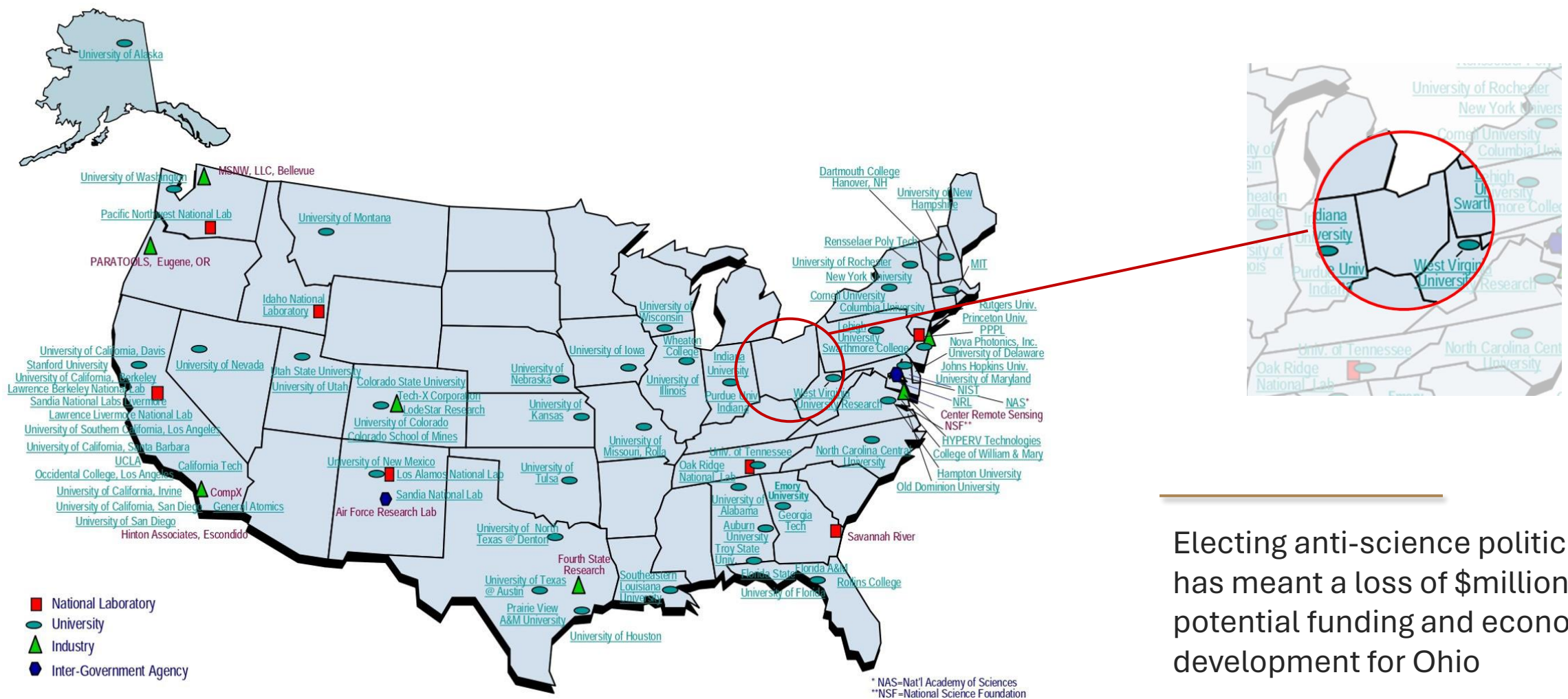
## Highlights:

- \$32 billion (\$2 billion in 1945) in federal funding
- 129,000 jobs
- Put Los Alamos, NM and Oak Ridge, TN on the map

America's first megaproject – a model for finally commercializing Fusion



# CURRENT (DISJOINTED) FUSION EFFORTS



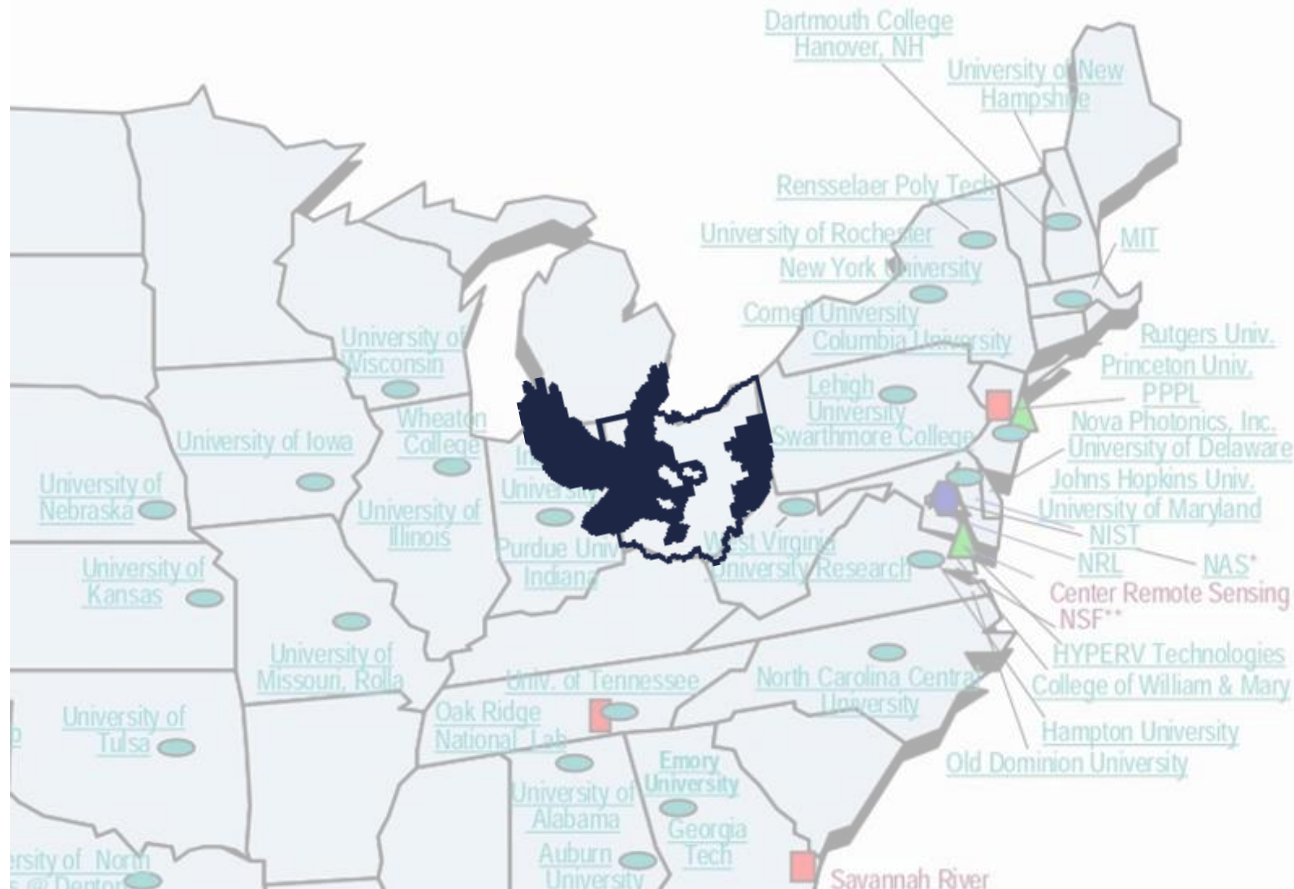
\*NAS=National Academy of Sciences  
\*\*NSF=National Science Foundation

Electing anti-science politicians has meant a loss of \$millions in potential funding and economic development for Ohio



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## A COORDINATED NATIONAL MEGAPROJECT



We don't know which fusion technology will win, but we know they will ALL require **advanced materials**

By leveraging Mahoning Valley's **coal & steel legacy**, an advanced manufacturing hub in Ohio-6 **can** produce these materials



**In a Gold Rush be the one making the shovels!**

# ADVANCED MANUFACTURING

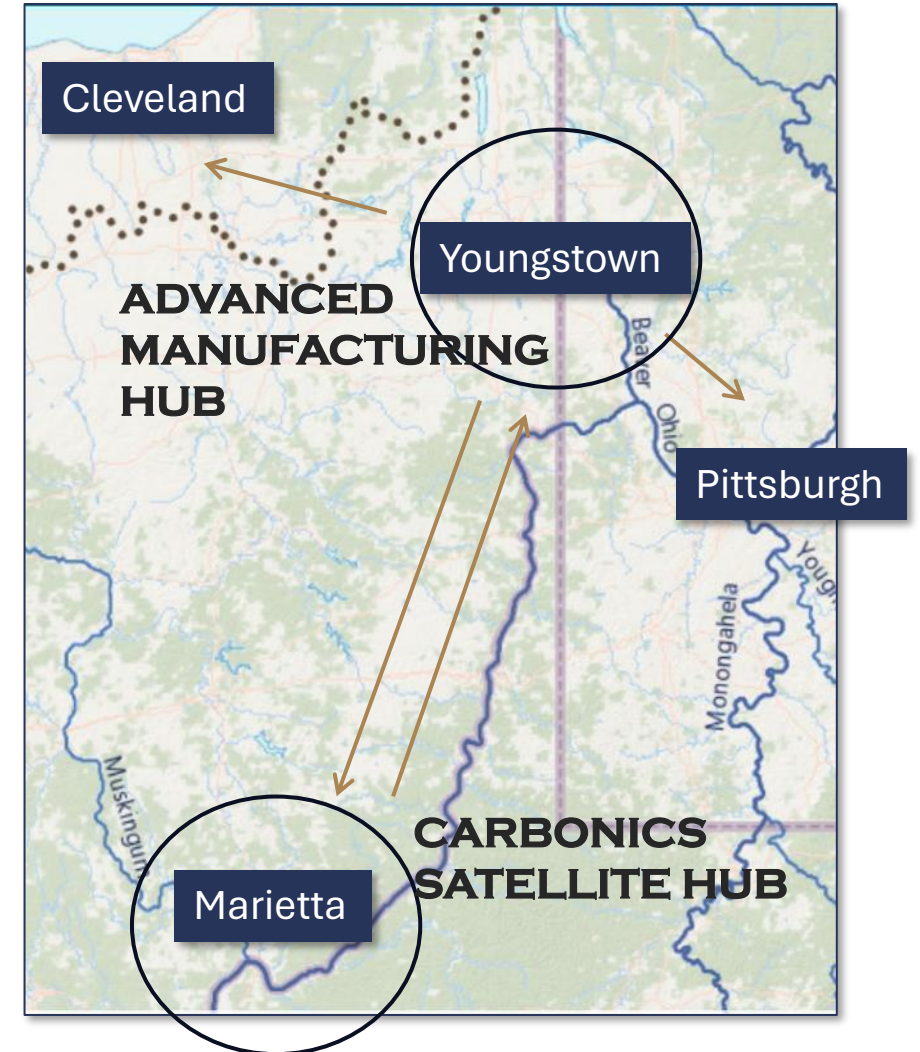
- **Youngstown** has the manufacturing heritage for an advanced materials manufacturing hub:

- Advanced metallics
- Advanced polymers
- Advanced ceramics
- Advanced composites
- Nanomaterials

- With **Marietta's** coal heritage, we will create an advanced carbonics satellite hub and guarantee that money will flow up and down the district enriching the 11 Counties.

- Germany rebuilt itself on the bones of its old manufacturing to become the powerhouse of Europe. **We shall** do the same for us to **become the powerhouse of America, yet again.**

**All this creates high-pay, high-skill, high dignity jobs GUARANTEED by federal funding**



# FUSION ADVANCED MATERIALS CHALLENGES

## Plasma Engineering:

- Functional and diagnostic materials that operate under severe thermal-mechanical, corrosion, and radiation environments
- Liquid-metal Plasma Facing Components (PFC) construction
- High-temperature super-conducting (HTS) magnets
- Plasma heating actuators and drivers

## Diagnostic Testbeds:

- High-temperature material modeling (plasma divertor, plasma confinement chambers, PFCs)
- Thermal management of heat exhaust and gas interchange to remove helium ash/optimize D-T mix
- Heat and mechanical loading testing of Lithium blanket

## Responsive Material Manufacturing:

- Structural materials for vacuum vessel, neutron shielding, and lithium blanket
- Cryogenic neutron testing of advanced materials to find neutron degradation limits
- Reduced activation ferritic martensitic (RAFM) alloy development for first wall and vacuum vessels
- Anti-corrosive material development to reduce tritium inventory and increase T-breeding/extraction rates
- High-frequency gyrotrons
- High neutron/heat compatible ion cyclotron antennas



# YOUNGSTOWN

A NEW PLAN FOR A NEW ERA

## We lost Blue-Collar jobs:

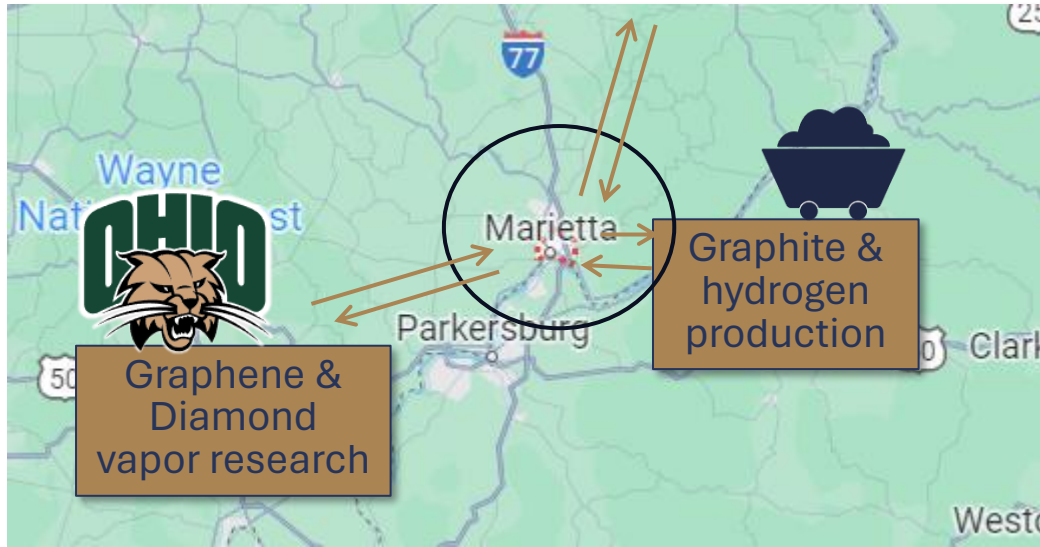
- In the 60s, Youngstown had the highest household income per capita in America. Today we are one of the poorest districts there is.
- After “Black Monday”, we lost:
  - 40,000 jobs
  - 400 satellite businesses
  - \$1.6 billion in economic activity (FY24 dollars)

## We will gain New-Collar jobs:

- High-skill, high-pay, high-dignity jobs that do NOT require advanced degrees
- Like blue-collar, but safe and well-paid with less hours
- A national program like ITER will create over 130,000 jobs and will generate over \$30 billion of Economic Activity; even partial success **will bring back prosperity to our district**
- Fusion-related operations and spin-off businesses are **over 80% blue(new)-collar jobs** (metal workers, electricians, construction workers, miners, masons, craftsmen, plumbers, welders, painters, etc.)

**From Blue Collar to New Collar: advanced skills, NOT advanced degrees**

## MARIETTA – A DIAMOND IN THE ROUGH



### Washington County

Marietta-Belpre become the small business hub for advanced carbonics commercialization, fed by research and production facilities in the greater area and the hub for critical fusion inputs.

### Pleasants Power Plant (and others):

- Using coal to create graphite – a key ingredient of lithium-ion batteries
- Will use coal for hydrogen production – a **greener, hotter, and cheaper fuel than natural gas**, perfect for use in advanced chemical production and metallics (steelmaking/ironworks)  
**This is the fuel needed for Fusion.**
- Hydrogen makes “clean coal” cleaner and is used in producing ammonia – the primary ingredient for a cheaper fertilizer for our farmers

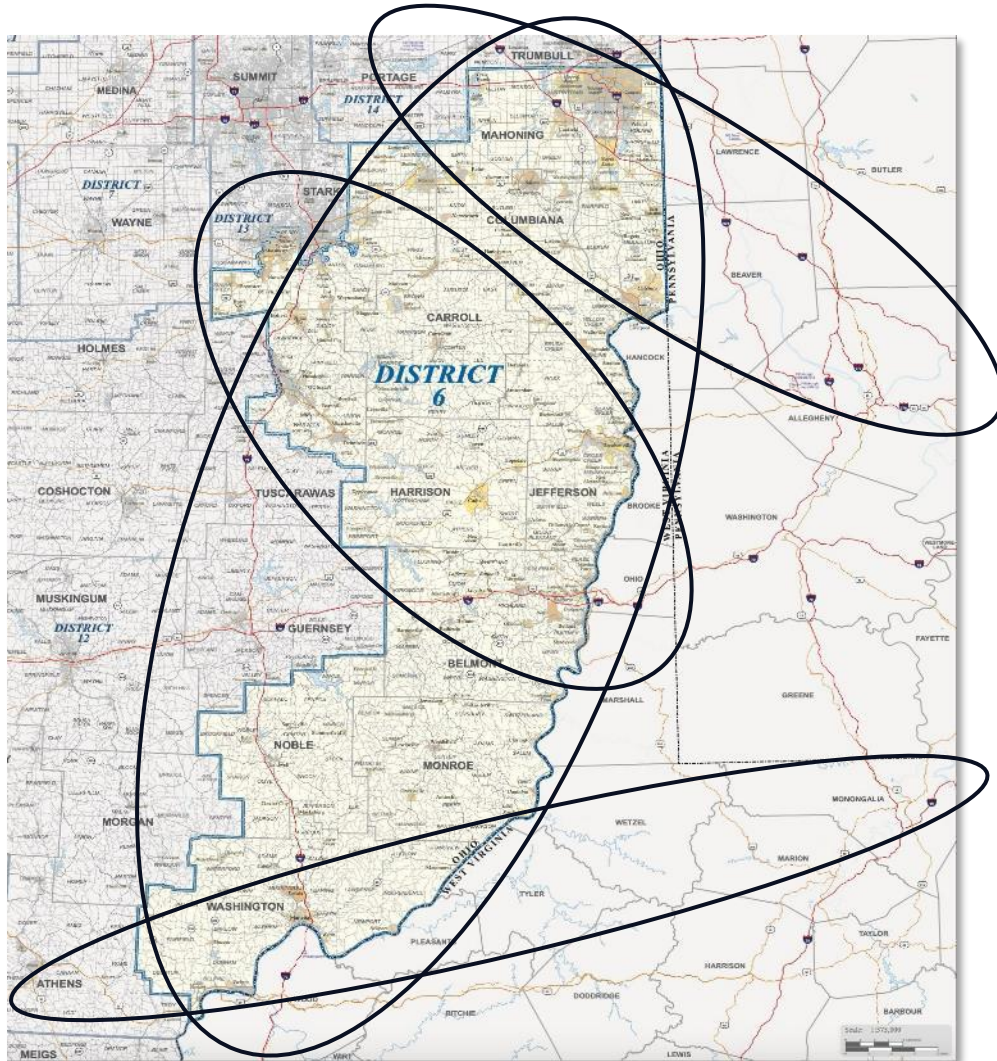
### Ohio University, Athens

- Commercialize OU’s carbonics research
  - Graphene – stronger than diamond, lighter than steel, more conductive than copper
  - Diamond vapor – the hardest material in the universe, has ultra-high thermal conductivity
- Carbon-doped magnets for next-gen plasma confinement
- **All of these are essential for commercializing Fusion**



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# PROSPERITY FOR OH-6



## Everyone Benefits:

- Advanced Materials Manufacturing and its spin-offs will generate **economic activity throughout the entire district**
- **Youngstown-Marietta interconnect:** East Liverpool, Steubenville, Martins Ferry, Belpre
- **Akron-Wheeling interconnect:** Canton, Massillon, New Philadelphia, St. Clairsville
- **University interconnect:** OU, WVU, YSU, Pittsburgh universities
- **Spin-off business sectors:** medical technology, aerospace, telecommunications, high-energy physics, robotics, Envirotech, lasers & optics, high-performance electronics

**This plan will benefit 11 congressmen and 6 senators. We will NEVER have a “Black Monday” ever again!**



# RESTORE THE AMERICAN DREAM

**VOTE KRIPCHAK**

**JUNE 11**