



U.S. DEPARTMENT OF  
**ENERGY**

# Path Forward after the White House Fusion Summit

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With contributions from Dr. Rich Hawryluk, PPPL

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# White House Summit announced U.S. ambition to demonstrate the feasibility of commercial fusion energy on a decadal timescale



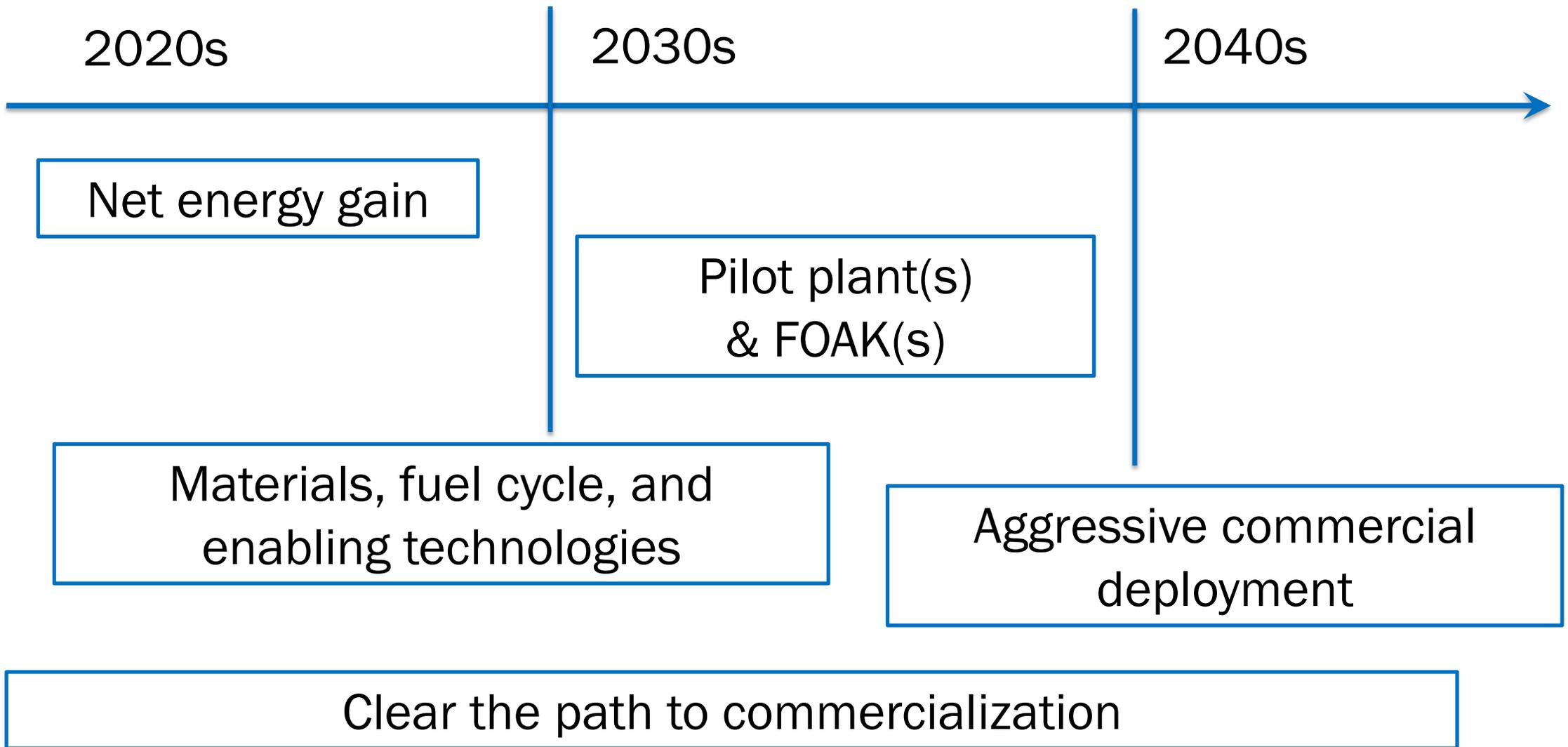
## WHITE HOUSE SUMMIT: *Developing a Bold Decadal Vision for Commercial Fusion Energy*

**THURSDAY, MARCH 17, 2022**

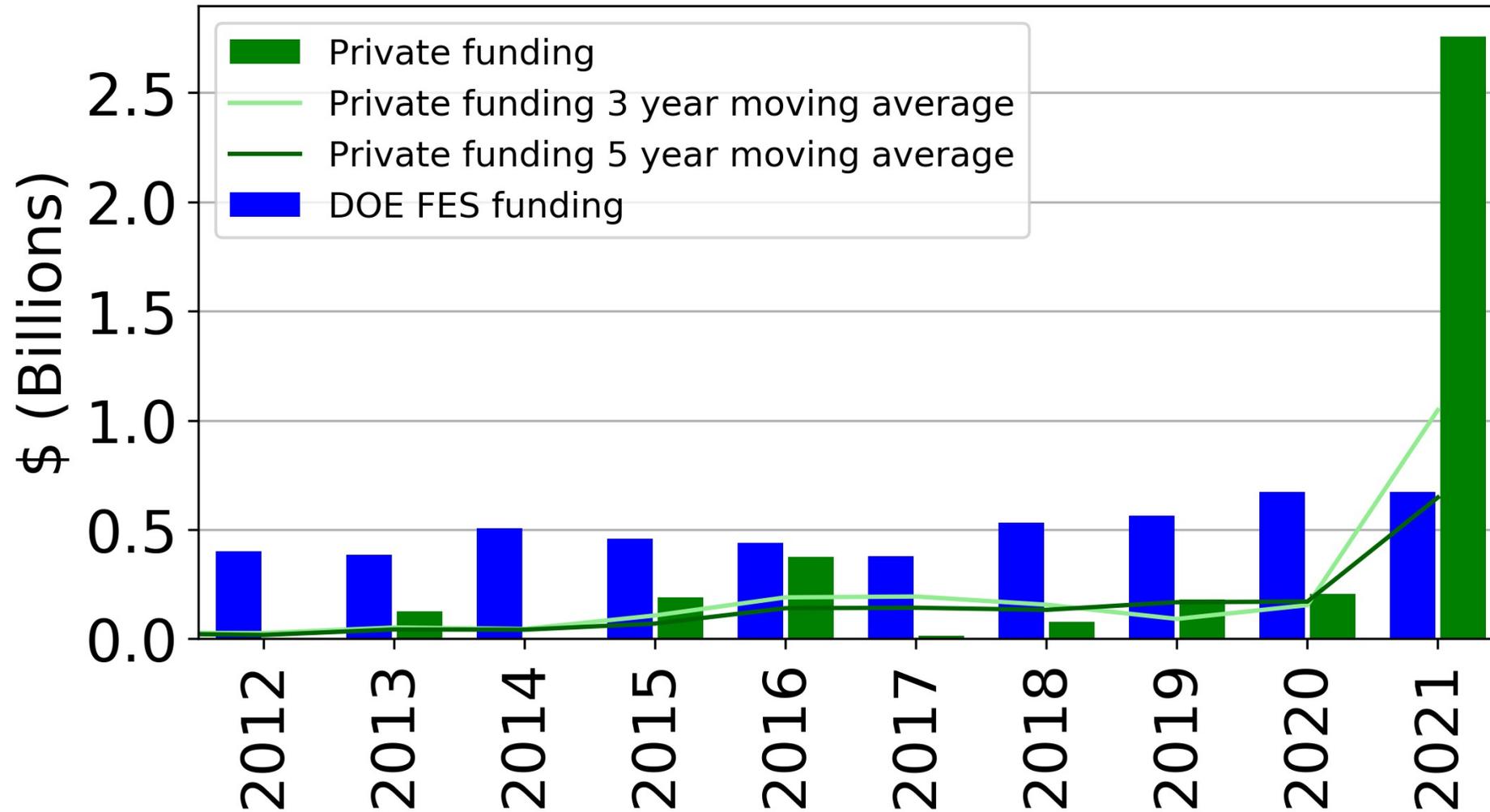


- Game-changing innovations like fusion can help the world get to net zero, and ensure U.S. energy security and technological leadership
- Celebrated decades of progress and recent major achievements enabled by sustained bipartisan support
- Fusion can distinguish itself as an energy technology by engaging society starting right now in support of energy justice and building a diverse workforce that looks like and benefits all of America
- Heard from the ambitious fusion private sector on how they are working to deliver fusion as a globally scalable, carbon-free energy source on a timescale that matters

# Bold decadal vision aims to enable...

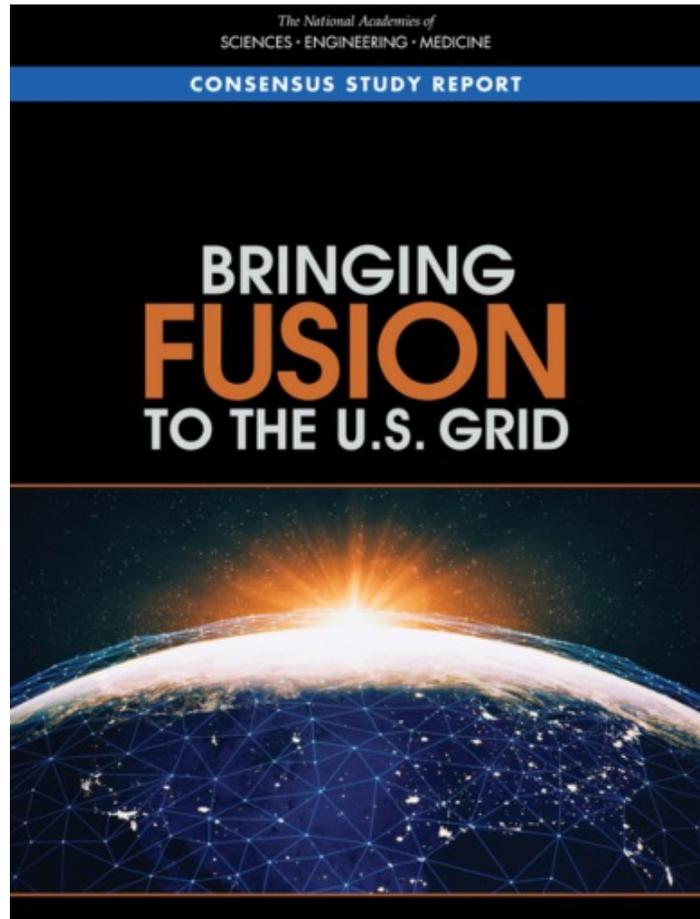


# Growth of private funding enables this opportunity



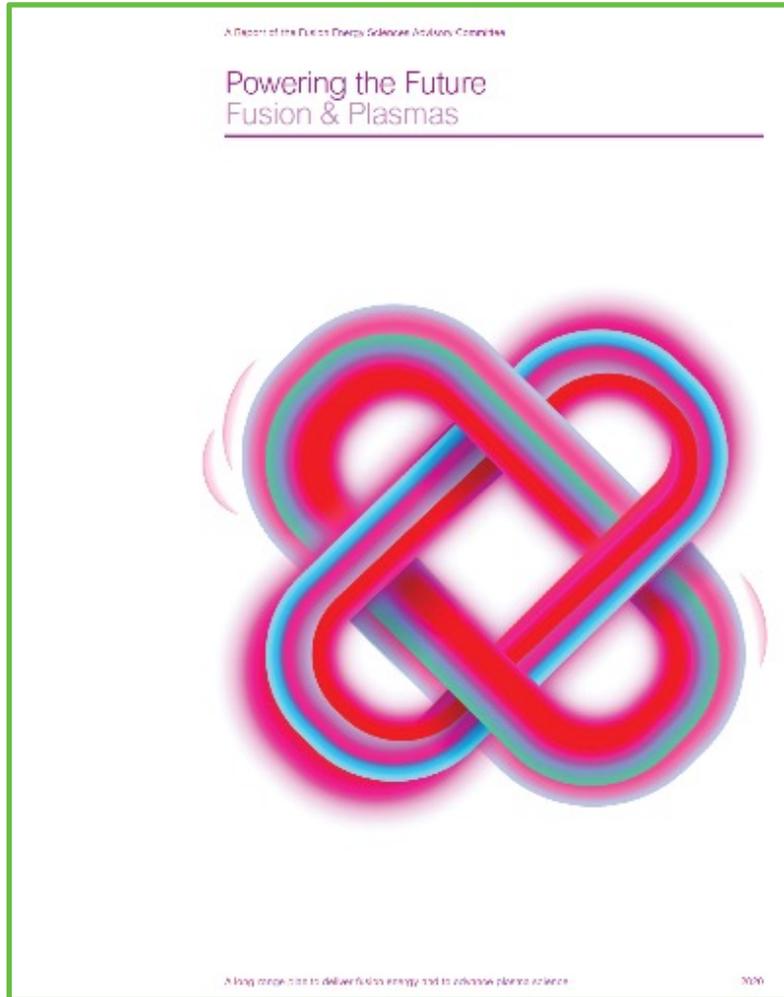
Plot credit: Sam Wurzel, Technology-to-Market Advisor, ARPA-E

# Our strategy is guided by key recommendations from the NASEM report *Bringing Fusion to the U.S. Grid (2021)*



- To ensure US leadership and impact the transition to net-zero by 2050, DOE and the private sector should demonstrate net electricity in a fusion pilot plant in the 2035–2040 timeframe
  - White House Summit declared ambition to accelerate this to the early 2030s
- DOE should move forward now via public-private partnerships to develop and bring fusion to commercial viability
  - First step is a milestone-based fusion-development program to be launched as soon as possible using enacted FY22 appropriations
- Urgent investments by DOE and private industry are needed to resolve the remaining S&T issues to realize a fusion pilot plant
  - We are working to build support to realize at least one FPP on a decadal timescale, in partnership with the private sector

# We will pursue the highest priorities from the FESAC Long-Range Plan within requested and appropriated budgets



- Fusion prototypic neutron source (FPNS)
- Design capabilities for fusion pilot plants
- New R&D opportunities aligned with the three science drivers
  - Sustaining a burning plasma (predictive capability for plasma core)
  - Engineering for extreme conditions (including materials and heat-exhaust solutions)
  - Harnessing fusion power (including tritium fuel cycle)
- Explore ways to accelerate fusion RD&D broadly via public-private partnerships

# We are drawing from the experiences and models of successful public-private partnerships, and considering RFI responses

**Milestone-based program that enabled SpaceX**

National Aeronautics and Space Administration 

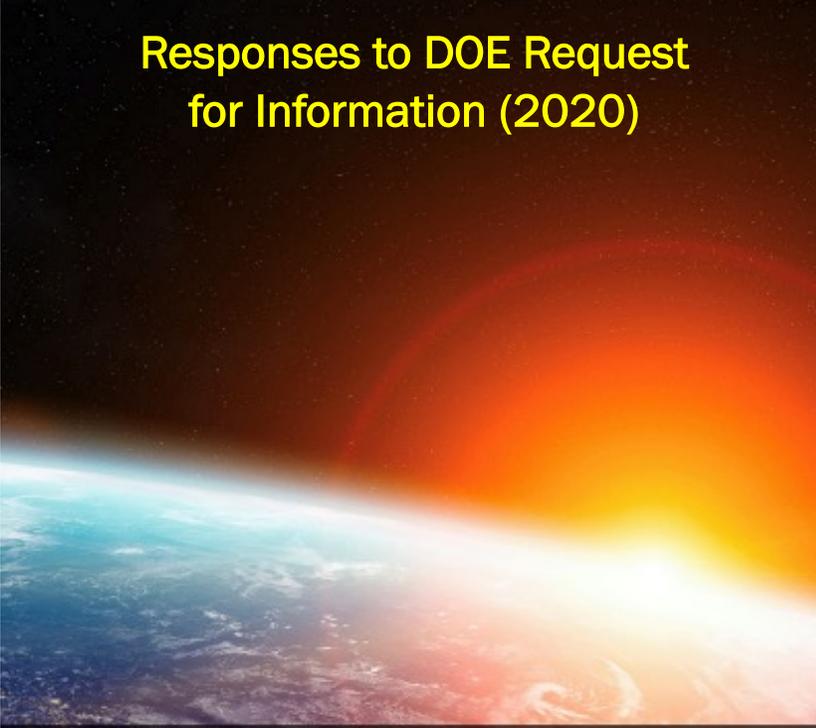
Commercial Orbital Transportation Services

A New Era in Spaceflight



NASA/SP-2014-617

**Responses to DOE Request for Information (2020)**



**Cost-Sharing Partnerships in Fusion Energy Development**

Responses to the Department of Energy's Request for Information

# Our plans are well aligned with enacted legislation

- **Energy Act of 2020, Sec. 2008 Fusion Energy Research**
  - The Director shall carry out a fusion energy sciences research and enabling technology development program to effectively address ... challenges to building a cost-effective fusion power plant and to support the development of a competitive fusion power industry in the U.S.
  - The Secretary shall establish ..., a milestone-based fusion development program... that will enable the construction of new full-scale fusion systems capable of demonstrating significant improvements..., as defined by the Secretary, within 10 years...
- **FY2022 Appropriations Act, Division D, Energy and Water Development and Related Agencies**
  - The Department is directed to follow and embrace the recommendations of the [FESAC long-range plan] *Powering the Future*
  - The agreement reiterates House direction on the Milestone-Based Development Program...
- **Considering/prioritizing other elements from the Energy Act of 2020**

# Workshop June 1–3 in Washington, DC, by invitation

## DOE Workshop on Fusion Energy Development via Public-Private Partnerships

June 1 - 3, 2022

Capital Hilton, 1001 16th Street NW, Washington, DC

*Hosted by the Office of the Under Secretary  
for Science and Innovation*

*Sponsored by the Office of Science*

- Bring together technical R&D and commercialization stakeholders to provide input on next steps:
  - Broader decadal needs to “clear the path to commercialization” including possible policy/legislative actions
  - Aligning public- and private-sector fusion R&D activities
  - Milestone-based fusion-development program in partnership with the private sector

# We will soon kick off a new Fusion Crosscut Team

- **Led by Scott Hsu, with FES AD (James Van Dam) and ARPA-E Fusion T2M Advisor (Sam Wurzel) as co-chairs**
- **Other offices represented as founding members**
  - NNSA (NA-113 Inertial Confinement Fusion)
  - SC BES and ASCR
  - Nuclear Energy (NE)
  - Economic Impact and Diversity (ED)
  - Savannah River Site Office/Environmental Management (EM)
- **Possible additional offices to invite as fusion development progresses**
  - OTT, OCED
  - NNSA NA-20 (nonproliferation)
  - CESER

# Immediate priorities

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- **Milestone-based fusion-development program**
  - Enabling use of Other Transactions (OT) authority for desired flexibilities
- **Launch fusion crosscut to develop DOE-wide strategy**
- **FY24 budget request**
- **Sustainable programmatic models for labs and universities to contribute to FPP RD&D in partnership with the private sector**
- **DEIA and EJ initiatives**
- **External partnerships for “clearing the path to commercialization”**

# Q&A