

# STELLAR ENERGY FOUNDATION

PROPELLING FUSION TO THE GRID

*SOON ENOUGH TO MAKE A DIFFERENCE*

## SEF's Mission

Bring fusion energy to the zero-carbon power portfolio soon enough to make an impact on climate change

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# Why Fusion

- Inherently safe scalable unlimited power source
- Zero-carbon
- The only clean energy solution with suitable density to economically supply the world's foundational energy supply
- A critical power complement to other renewable sources

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# Why Now

- Global consensus on the need to start working NOW to prevent catastrophic climate change
- Breakthrough advances in computation and simulation, materials, and additive manufacturing
- Timeline to practical deployment much shorter than public perception
- Need for steady state, load securing, distribution supporting, dense energy supply to meet continuously expanding demand for electricity
- Capacity to meet central grid structures as is; future grids and energy supply needs as developed

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# Acceleration of Commercialization

- More than 20 private fusion ventures of varying sizes and maturity; some forecasting energy of the grid by 2030
- Supplier market gaining interest Support from private sector (venture capital) and public sector (ARPA-E, APLHA program in DOE), billions of dollars in aggregate
- Multiple credible technical approaches to demonstrate pilot plants before 2030

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# Why SEF

- People: Experienced team with record of achievement and effectiveness
- Non-profit structure provides a zone of cooperation for the common good
- Only energy & environment NGO with this pioneering mission
  - Unbiased
  - Mission-driven
  - Collaborative

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# What SEF Does

- Public and private sector stakeholder outreach, education & training
- Direct advocacy to establish fusion as part of the world's clean energy ecosystem
- Government relations
- Creation and distribution of fusion education and messaging materials
- Targeted technology support
- Establish a base of philanthropic support to advance fusion's shared advocacy and technical needs

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# Snapshot of the Mission Pathway

- Develop and grow governmental, commercial, energy and climate fusion network
  - Placing fusion into policies, discussions, planning and partnership approaches
- Attract resources: build a base of public, private, and foundation support for a fusion inclusive agenda
- Develop educational materials suitable for opinion leaders, media, educators and advocates
- Develop comprehensive advocacy & technical needs database

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## Snapshot: Advocacy & Education Ideas

- Link development of synthesized media and advocacy campaigns
- Organize, align, communicate ongoing science and technical partnerships
- Excite the philanthropic and foundation space toward support of fusion advocacy and technology collaborations
- Advocacy Roundtables: bring energy, environmental, scientific and regulatory representatives into a collaborative space to garner a commonality of support for fusion soon enough to make a difference
- Link fusion to national clean energy discussions
- Create Speaker's Bureau / Media Center with talking points to provide fusion proponents as they engage their audiences
- Produce white papers; economic, policy, scientific, regulatory, etc.

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# Targeted Technology Needs: Background

- Transformative Enabling Capabilities (TEC's) exist which aid multiple commercial and research initiatives
- Supports needed occasionally by multiple companies, balance of plant items that all will need, but are not mission central nor proprietary
  - Neutron diagnostic hardware and software (APRA-e Webinar, [ARPA-e 1/23 Fusion Webinar-S. Hsu](#) )
  - Plasma physics simulation codes
  - Materials research
  - Develop full list through collaboration with industry members
- 2018 FESAC Report identified many such items;
  - Advanced algorithm, machine learning and AI tech applicable to plasmas and fusion
  - Advanced manufacturing techniques/3D printing/material science, i.e. liquid metal applications
  - HTS magnet materials and manufacturing methods
  - Tritium fuel cycle technology and advanced process control
  - Fast flowing liquid metal systems

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# How SEF Propels Action on Technology

- Implement a private, public, philanthropic - *P3* (Px, university, supply chain, etc.) funding schematic to drive timely uptake of TEC development
  - Multi-funded strategy brings unique characteristics of each sector to bear on programs
  - Private Sector:
    - Validates need and potential for commercialization
    - Risk/reward/patience determined by ROI
    - Mission critical technology is proprietary and IP
    - Culturally entrepreneurial and fast-paced
    - Funding potential large, but limited
  - Public sector:
    - Focus is on benefit to the public
    - Culturally institutional and risk-averse (in today's DC and State Houses)
    - Mixed outcomes on tech-to-market
    - Funding potential (\$) is significant, but subject to unpredictable and inconsistent nature of legislative bodies
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## How SEF Propels Action: Con't.

- Philanthropy
  - Valuable additional source of funding, influence and oversight
  - Targeted tech, non-proprietary, public benefit
  - With proper nurturing can be entrepreneurial, fast-paced and aggressive
  - Ability to provide predictable, milestone-based, multi-year funding
  - Non-profit structure provides tax-advantaged vehicle for donors and investors to support R&D needed across industry
  - Third party status helps enable multi-group interaction

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# What Can You Do?

- First and foremost supporting the mission of bringing fusion to the grid soon enough to make a difference is critical
- There are four means to currently support SEF;
  - Make a significant philanthropic contribution to SEF, while unrestricted donations are currently needed, designate the avenue most interesting if you wish
  - Support the mission as an ad-hoc advisor to the staff
  - Join one of our boards
  - Be a supporting leg of one of our P3's directly rather than through us

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# Who We Are: Executive Staff

- Experienced NGO and Public Advocacy Executives
  - Jane Hotchkiss – Executive Director
    - 30+ year career in clean energy technology
      - Grid Connected Projects
      - Policy Action
      - Advocacy
  - Wally Johnston – Managing Director, Advocacy Program
    - 38 year career in finance, technology and carbon free advocacy
      - Fusion Advocacy
      - Clean Tech Entrepreneurship
      - Finance & Technology Executive
  - Matt Miller, Ph.D. Physics – Managing Director, Tech Program(acting)
    - 40+ year career in leading edge technology
      - Operating Executive, Serial Entrepreneur, Investor and Advisor
      - Venture Capital and Private Equity

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# Who We Are: Founders & Board of Trustees

- Trustees: Experienced C-Suite Executives & Entrepreneurs
  - Jesse Treu, Founder, Chair and CEO
  - Matt Miller, Founder and President
  - Peter Burnim, Founder
- Public & private companies
- For profit & non-profit
- Investment, venture capital, operations, and governance
- High-tech & tech to market

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# Who We Are: Advisory Board

- Brian McDonald
- Maximus Yaney
- Additional members are in consideration for their expertise in;
  - Leaders in climate change solutions
  - Fusion science and technology experts
  - Philanthropists
  - Academicians
  - Clean energy executives

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