On the Path to Fusion

38th FPA Annual Meeting 2017

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What Fusion needs to be

- Start with End in Mind – applied product
- Clean and safe power generation asset
- Needs to compete with present energy sources
    - LCoE of ≲ 8 ¢/kWh, overnight cost of ≲ $5,000 per kW
- Minimized regulatory burden
- Clear market opportunity now (even vis-a-vis renewables + storage)

How do we get there? (1/2)

- Sense of urgency
- Broad target approach
    - Take advantage of advances in one concept to bootstrap others
- Look at (parallel) technology evolutions that might tilt equation in our favor
- Re-evaluate scale needed now and at full power plant
    - Smaller devices are cheaper, faster to built, easier to rebuild, etc
- Pool with stakeholders that may only have partial overlap with fusion goal
    - Attract more funding by building larger community
    - Critical mass to move public policy

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How do we get there? (2/2)

- Innovate fast
    - Don't be afraid of failure – learn by breaking things
    - Iterating is essential to fast progress
    - Generate volume of data necessary to apply AI and machine learning
- Public-private partnership
    - Involve industrial and private sector early
    - Helps to recalibrate goals
    - Introduces private sector thinking and customer needs

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How does TAE try to accelerate innovation?

- Build platforms with opportunities for fast cycles of learning
- Strategic partnerships to pool talents/resources
    - Tradition fusion partners – universities and national labs
    - Outside of typical fusion efforts – Google, utilities/EPRI, industrial sector
- Deploy advances in machine learning
    - Operational optimization
    - Feedback control – assessing and driving “patterns” might be good enough
- Aim for aneutronic fuel cycle
- Take advantage of forcing function provided by private capital

Thank you!