

Alternative Energy Track 1

- Who is end user?
 - Everyone
 - Medical, DoD, Business, Government
- What is greatest need/challenge?
 - Power for sensors
 - Alt. energy for space exploration
 - Alt. fuel commercialization

Alternative Energy Track 1

- Research Needed-Underway
 - Ultra high efficiency photovoltaic/thermo-electrics
 - How to capture wasted energy
 - How to capture energy in conversion

Alternative Energy Track 1

- Technology that could be “re-adapted”
 - Solar cell efficiency for sensors
 - Geothermal for stationary applications
 - Fuel cell

Alternative Energy Track 1

- Regional Partnerships to solve the challenge?
 - Private sector customers involved early- pull dual use technology from labor & start-ups
 - Multi-disciplined academic programs-combine chem/EE, mechanical/thermal eng, Etc.
 - Include Utilities in the partnership, share resources

Alternative Energy Track 1

- How does this relate to other tracks?
 - Improved agility and mobility of workforce
 - Cost reduction in business operations
 - Adaptive power management for users

Alternative Energy Track 2

- Who is end user?
 - Everyone
 - Benefits are multiple and potentially could keep companies or communities off the grid
- What is greatest need/challenge?
 - Power supply
 - Efficient, economical generation, conversion, storage, distribution
 - Effective battery storage
 - Converting linear to rotary motion

Alternative Energy Track 2

- Research Needed-Underway
 - Higher efficiency of conversion
 - Radio wave conversion
 - Algae & other bio fuels
 - Micro heat recovery/conversion system (heat is by product of motors/converters)
 - Thermal - Electric
 - Low DeltaT

Alternative Energy Track 2

- Technology that could be “re-adapted”
 - Material Sciences
 - Biovoltaics
 - Break open tech patents in advanced battery design that was purchased to ‘control’ the market
 - Thermo electrics
 - Re-use aeronautic IP for other applications
 - Create aftermarket regenerative
 - Technology to apply to existing hardware (e.g. harvest energy from brakes on cars)

Alternative Energy Track 2

- Regional Partnerships to solve the challenge?
 - Long term research needed in Alt. Energy area, including workforce development
 - Academia, Jefferson Labs, Industry - design flexibility in power sources
 - VCERC
 - Sparta Technologies
 - NOAA, VPA, HRRP
 - Military / Power Company Partnerships

Alternative Energy Track 2

- How does this relate to other tracks?
 - Workforce Development/Research needed for long term
 - Makes sensors more flexible due to flexible energy source
 - Longer duration of ISR at ports/harbors
 - Power source enabling self sufficiency for everyone

Alternative Energy Track 3

- Who is end user?
 - Everyone
- What is greatest need/challenge?
 - Power for sensors
 - Alt. energy for space exploration
 - Alt. fuel commercialization
 - The challenge is that if we don't do multiple sources we become at risk

Alternative Energy Track 3

- Research Needed-Underway
 - How to assess alternative sources from a systems perspective
 - Need to pull IP out of gov't research and put into small/large business
 - Efficient storage of alternative energy

Alternative Energy Track 3

- Technology that could be “re-adapted”
 - IP from large companies that has been purchased as ‘competitive’ blocking strategy
 - IP and technology from aerospace, high tech applications

Alternative Energy Track 3

- Regional Partnerships to solve the challenge?
 - Bring together end users, identify their problem, engage academic, R&D community and business for solution
 - Think creatively, mix the problem solvers with the users

Alternative Energy Track 3

- How does this relate to other tracks?
 - Use of alternative energy benefits any user of power
 - Use of alternative energy supports self sufficiency for all stakeholders