

Energy Working Group Report

Jatin Nathwani, Michael Case, Sarah Thorne, Paul Roege,
Gudni Johannesson, Richard Rocheleau, Richard Carlin, Paul
Marks, Monica Ogradowski, Ron Lacire, Valery Levchenko,
Vala Ragnarsdóttir, Zachary Collier

Paper Outline

- 1 Need for Sustainability
- 1.1 Intro – sustainability: local and global challenges, military requirements
- 1.2 Energy sustainability
- 1.3 Resilience
- 1.4 Stakeholder engagement in decision making
- 1.5 Portfolio approach

Paper Outline

- 2. Key Concepts
 - 2.1 Integrated systems approach
 - 2.2 Exergy, energy quality
 - 2.3 Energy water nexus
 - 2.4 Resilience, reliability, etc.
 - 2.5 Security
 - 2.6 Challenges and sustainability, resources
 - 2.7 Sustainable mobility

Paper Outline

- 3. Technical Solutions
 - 3.1 Efficiency and energy use
 - 3.2 Energy conversion
 - 3.3 Distribution
 - 3.4 Storage

Paper Outline

- 4. Innovative Implementation Strategies
 - 4.1 Behavior and judgment
 - 4.2 Mental modeling
 - 4.3 Social judgment
 - 4.4 Social friction
 - 4.5 Influences on judgment
 - 4.6 Socio-political
 - 4.7 Regulatory
 - 4.8 Business case/financing

Paper Outline

- 5 Use cases
 - 5.1 Transportation integration into energy systems
 - 5.2 Off-grid remote processes
 - 5.3 Hybrid energy systems
 - 5.4 Iceland military base and Germany base
- 6 Conclusion
 - 6.1 Research needs
 - 6.2 Path forward, governance

Research Needs

- Scalable energy networks
- Macro decision model for resilient communities
- Convergence on standards
- Data mining to enable real time analysis and decision making
- DC networks
- Behavior and decision making, visualization

A Cautionary Haiku

homo artiflex insatiable consumption
energy from ice and fire
move over elves