Introduction

- Systems approach includes 5 components: management, context, identification of problem, finding solution, and implementation of solution.
- Energy considerations: sources, distribution, and conservation;
- Maximum energy potential, feasibility, economic viability and societal acceptance have to be considered for each of these.
- Interactions with other complex systems such as food, water must be considered.

Al George

- Energy is a topic of tradeoffs. Quantification of economic and environmental impacts is essential.
- Challenge is to accomplish this and find funding for such projects.
- Systems area faculty hires needed.

Jeff Tester

Attendees expressed their interest in systems, sustainability and energy, mentioned related research areas and colleagues who should be contacted. Cornell’s breadth of research and interest in sustainable systems in Engineering, AAP, AEM, and Agriculture was evident as was some cross-colleges collaboration underway, including with Human Ecology.

Common themes raised by attendees describing their areas of interest include: fusion, electric power systems, wind energy, solar, carbon sequestration biofuels, systems, mathematical and computational approaches to complex systems. Two evident areas of cooperation were sustainable transportation and the Smartgrid.

Attendees mentioned other colleagues who are share these interests: Mason Peck, Steve Pope, Hsiao-Dong Chiang, Larry Walker, Lars, Angenent, Beth Ahner, Bob Thomas, Lindsay Anderson, Don Greenberg, Linda Nozick, Oliver Gao and Mark Turnquist

The Way Forward: a follow-up meeting leading to collaboration for (a) systems view of large problems (b) adding systems aspects into existing projects.

Attendees:
Lance Collins
    Interest in potentially hiring more faculty; MAE has a number of faculty with research interest in systems area: space systems, rotating machinery, combustion, wind energy, electric vehicle, etc.
Lang Tong
    Expertise in communication networks/IT; interested in Smartgrid and energy distributions; optimization; large scale estimation learning problems
Dave Hammer
    Fusion energy expertise; how to bring more systems perspectives into the problem
Norm Scott
  Sustainable communities;
Ray Zimmerman
  Tools for simulating electric power systems, integration of wind and storage, impact of environmental problems
Brandon Hensey
  Integration/coordination/control problems, modeling, predicting behavior; integration smart/micro grids and wind energy
Kevin Pratt
  Systems approach to sustainable design; develop a very fast architectural systems design including social aspect of architecture as well as pure aesthetics; attention to cultural aspects
Mike Hoffman
  Biomass from various sources; capturing all aspects in the systems approach
Dave Dieterich
  Background in chemistry and material sciences
  Interest and experience with bringing products to market
Michael Moore (University of Calgary)
  Experience in regulatory world; research on carbon controls and markets, how to set price on elementary carbon vs. transformed carbon
Antonio Bento
  Economics aspect; large computable equilibrium models, behavior across agents in a system; cost and environmental impact of biofuel mandates; optimal use of feedstock and unintended effects of policies
Carla Gomes
  Interest in interdisciplinary groups and collaboration; experience in computation sustainability; optimization systems, machine learning, inference and Smartgrid
Tim Mount
  Power systems, deregulation and market effects; Smart grid integration & economics
Pierre-Alexander Gourdain
  Fusion and transition to practical power plants; trying to get people to put together a college-wide introductory engineering class for freshmen
Paulette Clancy
  Represents a solar energy group that is based across 2 colleges; looking at solar from the molecular level; all the way to a system that is tangible; link between sustainable business and solar work; Cornell could do more to break barriers across colleges
Brian Chabot
  Interest in larger systems and the social dimension
Frank DiSalvo
  Director of CCSF which has worked with over 180 faculty, sustainability is the mother of all issues; interest in materials and batteries
Hector Tito Abruna
  Director of Energy frontier research center; goal to identify high performing materials and how to apply material development to fuel cells, batteries, etc.
John Guckenheimer
  interdisciplinary research, mathematics, nonlinear phenomenones; computational tools
Helene Schember
   Experience in management of technical programs;
Francis Vanek
   Sustainable energy for transportation and energy efficiency; developing “sustainable transportation for mega regions”
Terry Jordan
   Representing geology and atmospheric sciences; geological sequestration of CO2 and unconventional hydrocarbons
Al George (co-host)
   Systems; vehicles; energy; Systems Engineering Program; have about 7 faculty members interested in systems and working with others.
Jeff Tester (co-host)
   Overall energy and energy systems; geothermal.