

Energy, Environment, and Sustainability Task Force Recommendations

Engineering College Council Meeting – April 13, 2018



Energy Task Force

Engineering College Council

Summary

ECC Expertise can help in four areas:

- 1. Identification of private sponsors, fund raising and joint projects with students and faculty*
- 2. Technical expertise in a broad range of relevant technologies and challenges*
- 3. Business expertise to help with effective development and execution of plans*
- 4. Support efforts to build Cornell Brand as an energy leader*

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University Strategy 1: Build Energy Systems Institute “brand” by supporting development of new, innovative technology

- *Partner with energy companies for Co-op and research opportunities*
- *Work with the University to define “win-win” framework for cooperative development with the private sector*

ECC Brainstorm on potential Research/Corporate sponsorship programs :

- ✓ *Battery recycling studies*
- ✓ *North Campus new housing as “ground-up” opportunity*
- ✓ *Partner with Ag School on Carbon Sequestration, Biogas generation*
- ✓ *Work with utilities on load balance, pricing, supply/demand matching and cyber-security*
- ✓ *Earth Source Heat Funding*
- ✓ *Student Bio-diesel project funding*
- ✓ *Energy Conservation (LED lighting, etc.)*
- ✓ *Participate in the development of a nationwide HVDC network*

Recommendation: Form sub-committee to define ECC role in support of Strategy 1

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Build Energy Systems Institute “brand” by supporting development of innovative technology

Skeleton “Build the Brand” subcommittee charter

Membership: ESI/Select Faculty/ECC Representation

Role:

- 1. Identify and contact potential sponsors/partners to raise funds**
- 2. Work on cooperative development frameworks**
- 3. Participate in outreach as needed: e.g. Public Utilities,**
- 4. Develop calendar of public engagements to showcase Cornell ESI goals and progress (beyond research)**
- 5. Identify potential pilot and commercial outlets for emerging technologies**

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University Strategy 2: Cornell as Living Laboratory for world-class class energy systems research translated to commercial practice

- *Support Cornell objective to reach carbon neutrality by 2035*
- *Develop Earth Source Heat as new green technology*
- *Use “Big Data” to make the Cornell region a smart region*

ECC Brainstorm Input plan to reach carbon neutrality by 2035:

- ✓ *Viability and capacity of geothermal to meet goals*
- ✓ *Availability of carbon neutral electricity off the grid*
- ✓ *Opportunity to sell energy to the grid for carbon credits*
- ✓ *Opportunity to purchase energy off the grid at low prices and store it as heat or hydrogen*
- ✓ *Future pricing models and assumptions*
- ✓ *Smart classrooms*
- ✓ *No/low carbon campus transportation systems*
- ✓ *Encourage energy conservation behaviors by Cornell Community*
- ✓ *Consider building a Cornell campus micro-grid for research and education*

Recommendation: Appoint ECC/Faculty subcommittee to oversee plans and milestones to achieving Carbon Neutral Goal

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Cornell as Living Laboratory for world-class class energy systems research translated to commercial practice

Skeleton “Cornell as Living Laboratory” subcommittee charter

Membership: Select Faculty/ECC Representation

Role:

1. Commission development (review) of overall plan to reach objective including key technology, funding and staffing milestones, contingency options and resource requirements
2. Monitor progress of critical technology developments and sponsor expert teams (Faculty, ECC and alum with expertise) to provide input on specific major elements for example:
 - Deep geothermal
 - Shallow geothermal
 - Heat storage
 - Low carbon transportation
 - Campus micro-grid
3. Critically assess progress versus plans and suggest course corrections as needed
4. Identify and refer projects/ opportunities for corporate cooperation or funding
5. Work in cooperation with ESI to fill technology gaps
6. Consider publication of an annual Cornell Sustainability report

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Next Steps

- ***Confirm priority of two energy strategies identified***
 - Build Energy Systems Institute “brand” by supporting development of new, innovative technologies
 - Cornell as Living Laboratory for world-class class energy systems research translated to commercial practice
- ***Identify ECC/University Point contacts to better define sub-committee charters***
 - ***Solicit Interest from Full ECC membership***
 - ***Sub-committee 1: Build the Brand***
 - ***Sub-Committee 2: Cornell as Living Laboratory***
- ***Review Charters and membership at Fall meeting***