

# Center for Sustainable Practices *at* Vermont Tech





# Vermont Tech

Founded in 1867, Vermont Tech is Vermont's only public college whose focus is technical education.

Today we serve roughly 1500 students enrolled in over 20 programs including 11 Bachelor's programs.

- Architectural & Building Engineering Technology
- Civil & Environmental Engineering Technology
- Computer Engineering Technology
- Dairy Farm Management Technology
- Electrical Engineering Technology
- Computer Information Technology
- Landscape Development & Ornamental Horticulture
- Mechanical Engineering Technology
- Architectural Engineering Technology
- Computer Engineering Technology
- Business Technology and Management
- Computer Information Technology
- Sustainable Design & Technology
- Diversified Agriculture





## Using Technology Wisely

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Vermont Tech has a long history of teaching students about applied science, technology and engineering.

- 90% of our graduates are Vermonters
- 98% place into jobs or further education
- 87% of graduates stay in Vermont

*However, we never really focused on the effects of our technologies on the environment or the way we live!*

So a group of faculty and staff started thinking about how to bring environmental awareness and green technology education to the college.



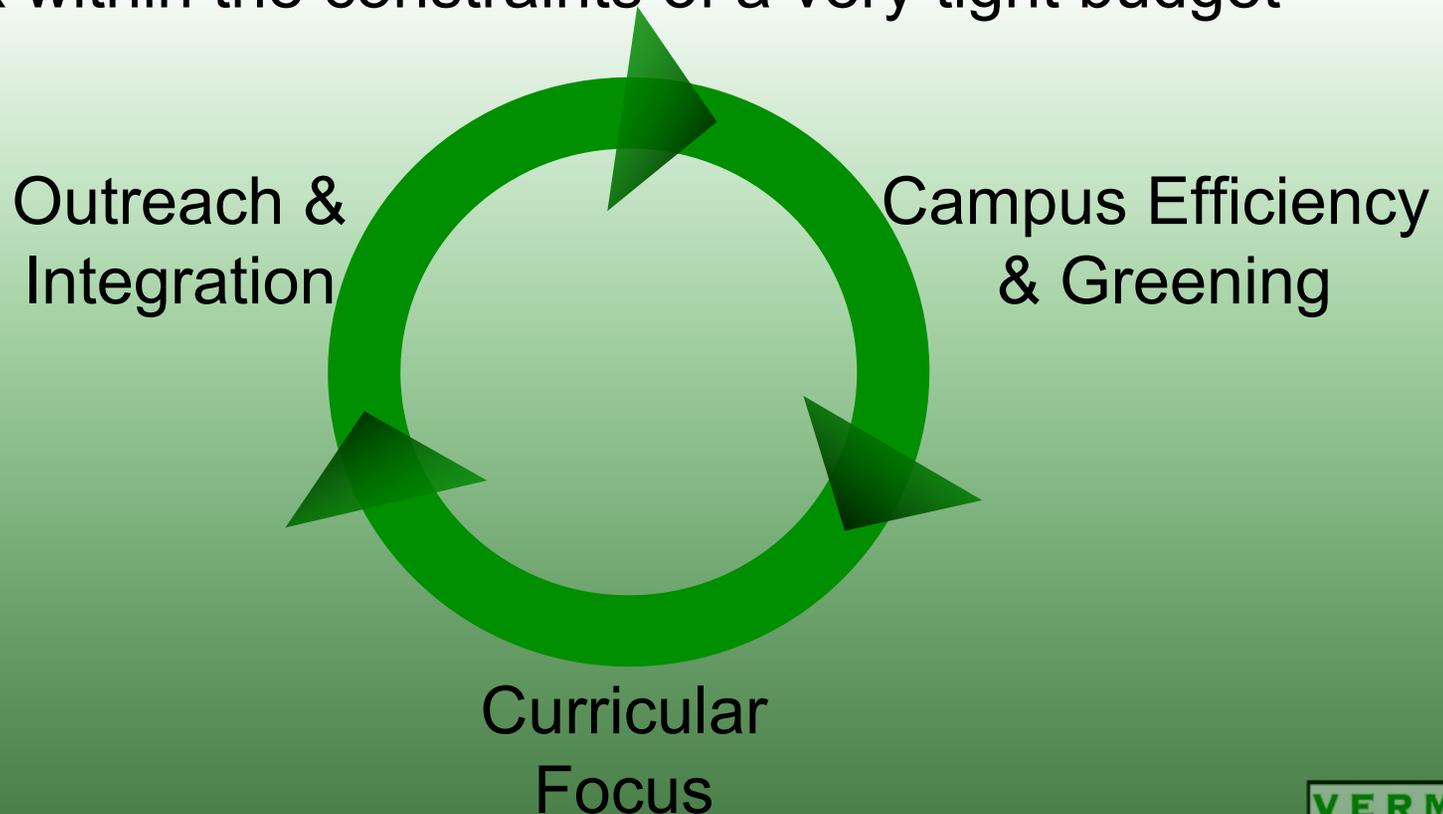


## Getting Started ?

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### **NEEDS:**

1. Educate our students about environmental challenges
2. Create a workforce with renewable/green tech skills
3. Work within the constraints of a very tight budget





# Campus Greening

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Volunteer Campus Sustainability Committee & a \$5000 budget

## Achievements 2006 - 2008

- Revitalized mixed recycling
- Shredded paper bedding on the farm
- Printing?!
  - Cartridges are recycled
  - 30% recycled paper
  - Limit on “free” printing
  - Duplexing encouraged
  - Printing from copiers
  - Scanning & posting vs. printing
- Environmentally friendly purchasing policy college-wide
- Chemical-free circuit board etching
- Cleaning cloths vs. paper towels
- Performance contracting with Hallam IC
- Computers:
  - Automatic sleep
  - LCD monitors
- Dormitories:
  - Light-bulb exchange
  - Energy Star encouraged
  - Move-out day
- Expansion of renewable energy use
  - Wood chip feasibility study
  - Community methane digester study
  - Grass-pellet boiler
- New Student Center is LEED Silver\*



# Sustainability for Technologists

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## Drivers & Goals:

- Hands-on, applications and technical focus
- Multidisciplinary approach
- Engage of students across technical programs
- Increased inter-program communication & interaction
- Work and service experiences
- A stronger focus on communication skills & group work
- Common sustainable theme

## Constraints:

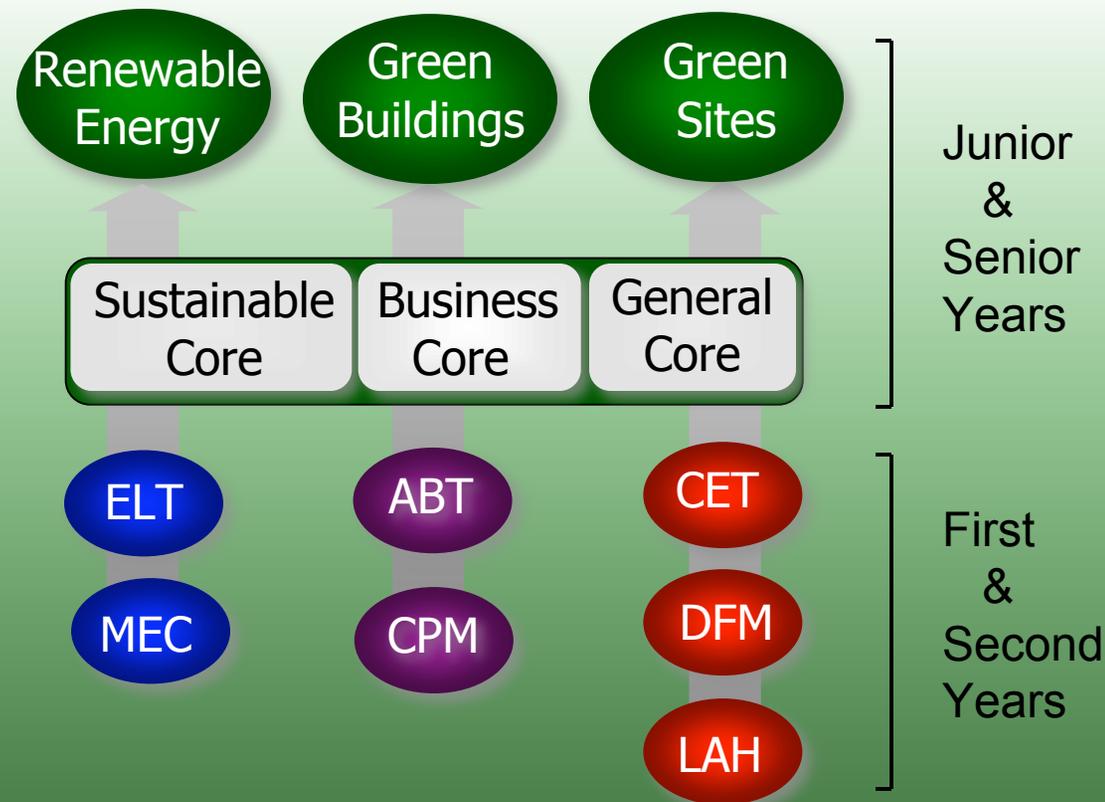
- Limited budget
- Faculty resources





# Sustainable Design & Technology

- Program design takes a '2+2' bachelors degree approach
- Students enter from AS programs
- A common junior/senior core and one of three concentration





## Courses ?

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A selection of junior & senior courses:

### Sustainable Core:

SDT Seminar

Conflict & Communication

Environmental Science

Green Energy Technical Survey

Green Sites Technical Survey

Green Building Technical Survey

SDT Studio I

SDT Studio II

### Business Core Choices:

Accounting

Principles of Management

Small Business Management

Principles of Marketing

Prin. Of Financial Management

Introduction to Business Law

Technical Project Management

### General Core:

Electives, Statistics, Bio, Chem, Physics



## For Example:

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A selection of junior & senior courses:

### Green Buildings:

Codes, Loads & LEED  
Controls & Commissioning  
Design Systems Integration  
Fluids & Thermodynamics

### Renewable Energy:

Sensors & Instrumentation  
Fluids & Thermodynamics  
Renewable Energy Systems  
Electromech Power Systems

### Green Sites:

Environmental Soils  
Permitting  
Water & Wastewater  
Groundwater & Storm water



# Center for Sustainable Practices

This initiative will reach *out* to businesses and communities, and *in* to SDT and other academic programs, to make **connections** to the “real world”.

***Dedicated to applying emerging green and sustainable technologies and practices in energy, building, land use, and agriculture***





## Our Goals for CSP

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### *Our Goals:*

- Educate Vermonters about global resources & climate change;
- Explore & apply solutions & practices that promote sustainability;
- Demonstrate green technologies & practices to Vermonters, & help them bring these solutions home; and
- Partner with Vermont businesses to grow the green economy.





# Our Vision for CSP

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## ***Our interests & concerns:***

- Energy
- Buildings
- Land Use
- Agriculture
- Education about GCC, environmental, resource & economic issues

## ***Our methods & mechanisms:***

- Workforce Training
- Community Projects
- Public Demonstration Projects
- Colloquia & Workshop Series
- Public Resource Center
- Service Learning
- Businesses Partnerships
- Green Business Incubator
- Internships
- K-12 Outreach & Partnership



# Agriculture

## **Market Garden**

2009 will be the third year of our campus Market Garden. In 2008 more than 12 vendors joined us on the college's front lawn for a Wednesday Farmers' Market.

With an expanded garden and more offerings we hope more vendors will join us in 2009.



## **Diversified Agriculture**

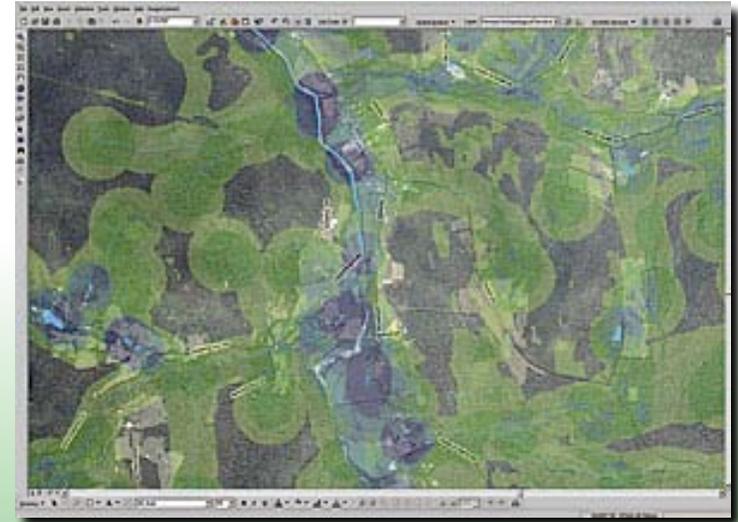
A bachelor's degree program in diversified agriculture is enrolling students for this fall (2009). This new program will help Vermont maintain its rural agricultural base and will strengthen local economies and provide local food supplies.



## Land Use

### ***Grass Energy Farming***

CSP and local farmers are exploring grass farming for energy. We are seeking funding for a grass pellet boiler to heat our agriculture building and to test a variety of pelletized fuels in partnership with the Biomass Energy Resource Center. We're applying for funding to develop biomass curriculum & training courses with BERC &



### ***GIS/GPS Training***

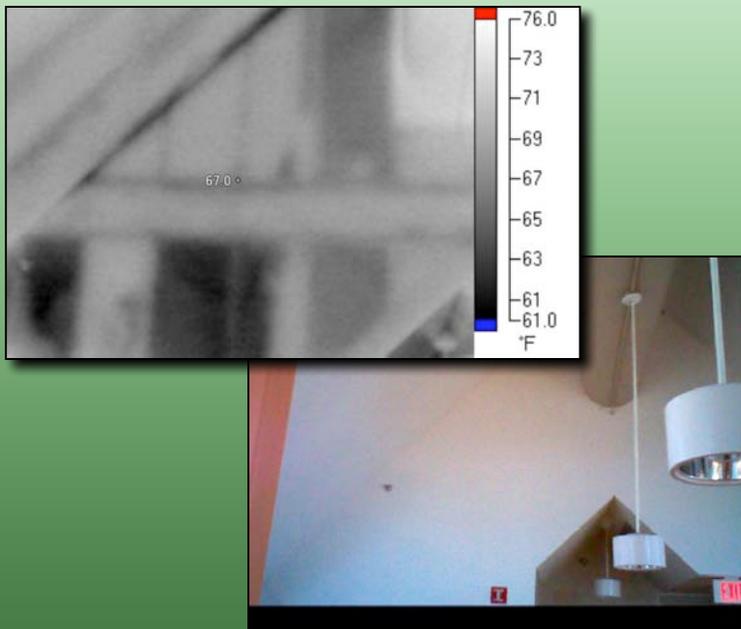
CSP & partners are developing GIS training programs for town officials & Vermont Tech students . This second level of training will augment the existing “Introduction to GIS Training Course” offered each summer by VCGI. CSP is also working with VCGI to complete a survey of awareness and use of GIS/GPS technologies by Vermont cities and towns.



# Green Buildings

## ***Campus Weatherization***

Many of our buildings were built before long before energy costs & energy efficiency were part of our daily consciousness. Our heating oil costs have doubled over the last year!. Students are working with professionals to evaluate buildings and estimate costs for weatherization. We hope that students will also help with the weatherization upgrades.



## ***Green Renovation***

Situated at the entrance to Vermont Tech, the Allen House will become a demonstration site for rehabilitation of older residential buildings using the highest possible standards of energy efficiency and renewable technologies applicable to historic structures.

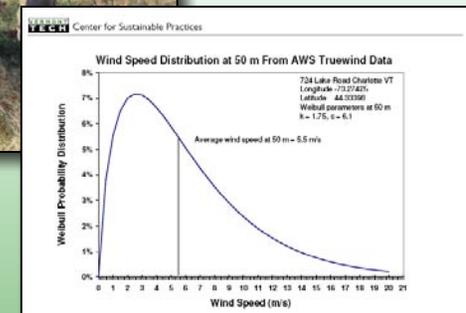




# Renewable Energy

## Anaerobic Biodigester

CSP, CVSWMD, VEC & VSJF, are investigating the feasibility of using cow manure and food scraps to produce methane, and generate heat and power on the Randolph Center campus. Our proposed Central Vermont Biomass Recovery Facility would be the first of its kind in New England.



## Anemometer Loan Program

Provides anemometer equipment to Vermont residents considering the installation of small wind systems on their property. Faculty and students install equipment, collect and analyze data, and generate a wind resource report for each site. We've got a 10 kW turbine on campus





# Energy & Workforce Training

## ***Workforce Training***

In 2009, CSP, TED and OEO will offer a series of seven weatherization certification trainings. This training will provide a quality, trained workforce for Vermont's low-income and private sector weatherization contractors. Residential weatherization is a vital tool in lowering fossil

fuel consumption and greenhouse

gas may warm!



## ***Solar Energy Training***

In 2009, CSP & partners, with the support of Senator Leahy's office, will offer introductory training in installation of solar energy technology. Participants will be eligible for NABCEP Entry Level certification. The goal for this first year is to have 30 students complete the course and successfully pass the NABCEP Entry Level Certification Exam.

**VERMONT  
TECH**



# Community Outreach

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## ***Biomass District Heating***

CSP is working with the Randolph Area Development Corporation and the Biomass Energy Resource Center to assess the feasibility of a wood, and perhaps grass, biomass combined heat and power system for use in Randolph Village. District heating would help Vermont's communities use local biomass for energy. This work is supported by the CEDF.



## ***Energy Education Outreach***

In May of 2008, students from the Orange public schools came to Vermont Tech's Randolph Center campus for a week of technical and hands-on activities. Faculty and staff helped students build and test simple solar thermal panels. Past projects have included building model wind turbines!





## Challenges?

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### ***So what's the view one year out?***

- Our small group of hard core CSP members is:
  - Excited!
  - A bit tired, but eager to move ahead.
  - Aware that communication is everything...  
... and that patience is the most important virtue.
  - Aware that we've got to stay focused on the projects that  
we can accomplish, rather than what we'd like to do.  
*(Our eyes are bigger than our feet can go!)*

### ***Lessons learned?***

- Prioritize
- Always look for more people and resources
- Look for synergy!



## Friends and Partners

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Our success flows from the many wonderful people and organizations who have helped get us started. We are **so grateful** for their support!

- Vermont Department of Labor
- Vermont Sustainable Jobs Fund
- Vermont Community Foundation
- Vermont Environmental Consortium
- Vermont Geographic Info Center
- Blittersdorf Foundation
- Northfield Savings Bank
- Town of Randolph
- Town of Randolph Energy Committee
- Brookfield Energy Group
- Three Stallion Inn
- Central Supplies
- Biomass Energy Resource Center
- Green Mountain Power Corporation
- groSolar
- Renewable Energy Vermont
- Vermont Department of Public Service
- Clean Energy Development Fund
- Vermont Office of Economic Opportunity
- Central Vermont Solid Waste Mgt. District
- Preservation Trust of Vermont
- National Trust for Historic Preservation
- Vermont Division of Historic Preservation
- Technology Extension Division
- Vermont Agency of Ag, Food & Markets
- Vermont Law School
- Two Rivers Ottauquechee RPC
- Central Vermont Community Action Council
- Central Vermont Regional Planning Commission
- Randolph Area Community Development Corp.
- Draker Laboratories
- NRG Systems and Earth Turbines
- Efficiency Vermont
- Vermont Energy Investment Corp.
- US Department of Energy



**Thanks!**

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