

## DYNAMIC INTEGRATIONS EXPERIENCE

### Investment Grade Technical Audits

Rockingham Central School		Bellows Fall	VT
Bellows Falls Middle School		Bellows Falls	VT
Bellows Falls Union High School		Bellows Falls	VT
Greater Rockingham Area Services		Bellows Falls	VT
Everett Hall	Southern Vermont College	Bennington	VT
Cone Office Building		Bennington	VT
Willis Office Building		Bennington	VT
Whitcomb High School		Bethel	VT
Bradford Elementary School		Bradford	VT
Richardson Block		Bradford	VT
Bradford Academy	for Zero by Degrees	Bradford	VT
Taylor Palmer Insurance		Bradford	VT
15 Commercial Buildings	Brattleboro Community Planning	Brattleboro	VT
Brookfield Elementary School		Brookfield	VT
Brookline School	Sunny Lane Daycare Center	Brookline	VT
Bennington	Ascutney Mountain Resort	Brownsville	VT
Essex	Ascutney Mountain Resort	Brownsville	VT
Hanover Building	Ascutney Mountain Resort	Brownsville	VT
Ski Services	Ascutney Mountain Resort	Brownsville	VT
Windham Building	Ascutney Mountain Resort	Brownsville	VT
Windsor Building	Ascutney Mountain Resort	Brownsville	VT
Cavendish Sewerage Treatment	for Zero by Degrees	Cavendish	VT
Chelsea Public School	for Zero by Degrees	Chelsea	VT
Dummerston Elementary School		Dummerston	VT
Base Lodge	Burke Mt	East Burke	VT
Business Office	Burke Mt	East Burke	VT
Bradford National Bank		Fairlee	VT
Guilford Central School		Guilford	VT
Bugbee Senior Center	Town of Hartford	Hartford	VT
Public Safety Building	Town of Hartford	Hartford	VT
Flood Brook Union School		Londonderry	VT
Black River Union High School		Ludlow	VT
Ludlow Elementary School		Ludlow	VT
College Street School		Middlebury	VT
Mary Hogan School		Middlebury	VT
Store, Warehouse, Bakery	King Arthur Flour Company	Norwich	VT
Tracy Hall	for Zero by Degrees	Norwich	VT
Marion Cross School		Norwich	VT
Sculpture	Goddard College	Plainfield	VT
Painting	Goddard College	Plainfield	VT
Library	Goddard College	Plainfield	VT
Maintenance	Goddard College	Plainfield	VT

Plymouth Elementary School		Plymouth	VT
Putney Central School		Putney	VT
Administration	Vermont Achievement Center	Rutland	VT
Education Therapy	Vermont Achievement Center	Rutland	VT
Pediatric Convalescent	Vermont Achievement Center	Rutland	VT
Swimming Pool	Vermont Achievement Center	Rutland	VT
Saxtons River School		Saxtons River	VT
Springfield High School		Springfield	VT
Missisquoi Valley Union HS		Swanton	VT
Vergennes Union High School		Vergennes	VT
Classroom/Office	The Mountain School	Vershire	VT
Dining Kitchen	The Mountain School	Vershire	VT
Derby House	The Mountain School	Vershire	VT
Tobold/Miles Building	The Mountain School	Vershire	VT
Main Building	The Mountain School	Vershire	VT
Red School House	The Mountain School	Vershire	VT
Albert Bridge School	for Zero by Degrees	West Windsor	VT
Westminster Center School		Westminster	VT
Gateway Motors		White River Jct	VT
Windsor Sewerage Treatment	for Zero by Degrees	Windsor	VT
Woodstock Town Hall	for Zero by Degrees	Woodstock	VT
Woodstock Community Care Home		Woodstock	VT
Windsor County Sherriff/Court	for Zero by Degrees	Woodstock	VT
Iselin Center		Syosset, N. Y.	NY
Bete Fog Nozzle Inc		Greenfield	MA
Clark Elementary School		Amherst	NH
Field House	Proctor Academy	Andover	NH
Steam Plant	Proctor Academy	Andover	NH
Andover Elementary School		Andover	NH
Administration Building	Hawthorne College	Antrim	NH
Gym/BAE	Hawthorne College	Antrim	NH
Hawthorne Airport	Hawthorne College	Antrim	NH
Hawthorne Hall	Hawthorne College	Antrim	NH
Hubbard Cafeteria	Hawthorne College	Antrim	NH
Peabody Hall	Hawthorne College	Antrim	NH
Scarborough Hall	Hawthorne College	Antrim	NH
Silver Library	Hawthorne College	Antrim	NH
Whelton complex	Hawthorne College	Antrim	NH
Bristol School		Bristol	NH
Brookline Elementary School		Brookline	NH
Farley Building		Canaan	NH
City Hall & Police Building	City of Claremont	Claremont	NH
Fire Station	City of Claremont	Claremont	NH
Public Library	City of Claremont	Claremont	NH

Annex	Sullivan County Home	Claremont	NH
Corrections Building	Sullivan County Home	Claremont	NH
Maple Hill Community Home	Sullivan County Home	Claremont	NH
Power Plant Bldg	Sullivan County Home	Claremont	NH
Recreation Bldg	Sullivan County Home	Claremont	NH
Residents	Sullivan County Home	Claremont	NH
Shute House	Sullivan County Home	Claremont	NH
Valley Regional Hospital		Claremont	NH
Franklin Pierce Law Center		Concord	NH
Unitarian Church		Concord	NH
Forest Glen Inn		Conway	NH
Justice & Administration	Strafford County	Dover	NH
Garrison Street School		Dover	NH
Town Hall	Town of Dunbarton	Dunbarton	NH
Demeritt Hall	University of New Hampshire	Durham	NH
Field House	University of New Hampshire	Durham	NH
Hamilton Smith Hall	University of New Hampshire	Durham	NH
McConnell Hall	University of New Hampshire	Durham	NH
Morrill Hall	University of New Hampshire	Durham	NH
New Hampshire Hall	University of New Hampshire	Durham	NH
Library, Dining, Physical Plant	Phillips Exeter Academy	Exeter	NH
Greenland Central School	for Zero by Degrees	Greenland	NH
Hanover Consumer Cooperative	Hanover and Lebanon Stores	Hanover	NH
Bernice A. Ray School	Hanover Schools	Hanover	NH
Frances C. Richmond School	Hanover Schools	Hanover	NH
Hanover High School	Hanover Schools	Hanover	NH
Fire Station	Town Of Hanover	Hanover	NH
Housing For Elderly	Town Of Hanover	Hanover	NH
Senior Center	Town Of Hanover	Hanover	NH
Dartmouth College Fraternities		Hanover	NH
Dartmouth Printing Co.		Hanover	NH
Montshire Museum of Science		Hanover	NH
Court House	Grafton County	Haverhill	NH
Nursing Home	Grafton County	Haverhill	NH
Steam Plant	Grafton County	Haverhill	NH
Haverhill Inn		Haverhill	NH
Tucker Free Library	Town of Henniker	Henniker	NH
Wastewater Treatment Plant	Town of Henniker	Henniker	NH
Town Garage	Town of Henniker	Henniker	NH
Henniker Town Hall	Town of Henniker	Henniker	NH
Airport Crash Facility	City Of Keene	Keene	NH
Airport Terminal	City Of Keene	Keene	NH
Keene Fire Station	City Of Keene	Keene	NH
Public Works Office	City Of Keene	Keene	NH

Sumner Knight Chapel	City Of Keene	Keene	NH
Transportation Center	City Of Keene	Keene	NH
Carle Hall	Keene State College	Keene	NH
Mason Library	Keene State College	Keene	NH
County Nursing Home	Belknap County	Laconia	NH
Central Fire Station	City of Laconia	Laconia	NH
Town Garage	City of Laconia	Laconia	NH
Holy Trinity School		Laconia	NH
Lakes Region General Hospital		Laconia	NH
Central Fire Station	City Of Lebanon	Lebanon	NH
City Hall And Theater	City Of Lebanon	Lebanon	NH
Public Works Garage	City Of Lebanon	Lebanon	NH
Sewage Treatment Plant	City Of Lebanon	Lebanon	NH
W. Lebanon Fire Station	City Of Lebanon	Lebanon	NH
West Lebanon Library	City Of Lebanon	Lebanon	NH
Lebanon Food Coop	Hanover Cooperative Society	Lebanon	NH
Rogers House	Lebanon Housing Authority	Lebanon	NH
Highway Garage	Town Of Littleton	Littleton	NH
Town Building	Town Of Littleton	Littleton	NH
Barnes Elementary School		Lyme	NH
Perinni Science Building	St. Anselm's College	Manchester	NH
Steam Plant	St. Anselm's College	Manchester	NH
Winnisquam Hall	New Hampshire College	Manchester	NH
Stark Hall	New Hampshire College	Manchester	NH
Maintenance Building	New Hampshire College	Manchester	NH
YM/WYCA		Nashua	NH
Nottingham Elementary School		Nottingham	NH
Memorial Hall		Orford	NH
Orford High School		Orford	NH
Orfordville School		Orfordville	NH
Portsmouth Hospital		Portsmouth	NH
Main School Building	Spaulding Youth Center	Tilton	NH
Westwood Hall Dining	Spaulding Youth Center	Tilton	NH
Howe Arts	Spaulding Youth Center	Tilton	NH
Richard Smart Gymnasium	Spaulding Youth Center	Tilton	NH
Williams Hall Administration	Spaulding Youth Center	Tilton	NH
Lambert Hall	Spaulding Youth Center	Tilton	NH
Young House	Spaulding Youth Center	Tilton	NH
Cutter Wiggins	Spaulding Youth Center	Tilton	NH
Community Center	Spaulding Youth Center	Tilton	NH
Colcord Cottage	Spaulding Youth Center	Tilton	NH
EChO Program	Spaulding Youth Center	Tilton	NH
Huggins Hospital		Wolfeboro	NH
Foodtown Stores		Cambridge	MA

G S A Office Building

Kapolei

Oahu

HI

ENERGY AUDITOR TRAINING

N. H. School Audit Program	25 Auditors	6 weeks
N. H. Institutional Bldgs. Program	11 Maint. men	4 weeks
Vt. Institutional Bldgs. Program	26 Auditors	4 weeks
Vt. Institutional Bldgs. Program	12 Auditors	2 weeks
N. H. Institutional Bldgs. Program	13 Auditors	2 weeks
N. H. Institutional Bldgs. Program	11 Auditors	2 weeks

ENERGY MANAGEMENT SEMINARS

17 Six Hour Presentations	Orange School District
NH Institutional Buildings Audit Program	New England Ski Association
13 Six Hour presentations	N. H. Department of Education
VT Institutional Buildings Audit Program	Energy and Man's Environment
Vermont Department of Education	University of Vermont
Granite State Electric	
Northeast Sustainable Energy Association Lighting Seminar	

ENERGY AUDITS

	<u>New Hampshire</u>	<u>Vermont</u>
Schools	415	369
Hospitals	37	6
Local Government	78	83
Public Care	16	23

**Donated community audits:**

Thetford Elementary School  
 Latham Library, Thetford  
 Thetford Center Community Center

CAMPUS WIDE AUDITS

	# of Bldgs.	Gross Sq Ft.
Vermont State Colleges		
Lyndon State College	14	309,443
Johnson State College	13	343,590
Vermont Technical College	12	263,412
Castleton State College	16	292,364
Proctor Academy	30	164,062
Spaulding Youth Center	11	51,556
St. Michael's College	20	640,650
The New Hampton School	28	195,697
Buxton School	5	35,150
High Mowing School	5	46,630
Crotchet Mountain Rehabilitation Center	12	300,805
Philips-Exeter Academy	15	369,700
Brewster Academy	5	59,000
Franklin Pierce College	15	291,000
New Hampshire Hospital	47	1,500,000
Brattleboro Retreat	8	357,481

COUNTY FACILITY STUDIES

Rockingham County, N. H.	5	209,278
Sullivan County, N. H.	8	119,627
Grafton County, N. H.	6	103,160

ACT 250 ENERGY INSPECTIONS FOR DEPARTMENT OF PUBLIC SERVICE

Facility	Location	Area
Central Vermont Medical Center	Barre VT	44,000
Green Mountain Lincoln Mercury	Barre VT	1,174
Mac's Brandon	Brandon, VT	1,855
Mac's Fairhaven	Brandon, VT	2,500
Chuck's Heating & Ventilation	Colchester VT	8,400
Coca Cola	Colchester VT	81,680
Motel 6 Colchester VT	34,000	
Costco	Colchester VT	3,636
Fitzgerald Construction	Colchester VT	9,000
Euro West Building 4 Essex Fair	Essex Center, VT	32,500
Dept NU4A Bldg 986 IBM Corp.	Essex Junction, VT	109,597
IBM Corp.	Essex Junction, VT	2,875
Killington Grand Hotel	Killington, VT	194,093

Aspen East	Killington, VT	9,500
Western Ridgeline Residences	Middlebury, VT	52,800
Bicentennial Hall	Middlebury, VT	214,000
Berlin Office Building	Montpelier VT	2,736
Mount Snow Summit Hotel	Mount Snow VT	211,000
Columbia Forest Prod.	Newport VT	24,000
Faith Lighthouse Assembly of God	Newport, VT	5,920
Handy Extended Care Suites	S. Burlington VT	17,160
Vermont Academy Zamboni & Art	Saxtons River, VT	4,420
Lake Champlain Waldorf School	Shelburne VT	1,600
Catamount Shelburne	Shelburne VT	7,200
Wake Robin Aquatic Center	Shelburne VT	6,000
Harbor Industries	Shelburne, VT	25,000
Sears	So Burlington VT	140,552
Shelburne Plastics	South Burlington VT	16,890
Vermont National Country Club	South Burlington VT	12,220
POP Building	South Burlington, VT	7,000
Carroll Concrete	St Johnsbury VT	2,012
Grenier Land Company	Waterbury VT	4,460
Country Club of Vermont	Waterbury, VT	5,400
Hampton Inn	White River Jct VT	53,000
A&S Collection	Williamstown, VT	2,592
E&M Mechanical	Williston VT	2,736
Bed, Bath And Beyond	Williston VT	40,000
Enman Retail/Office	Williston VT	7,000
Miller Group	Williston VT	113,700
Marriot Town Place Suites	Williston VT	58,000
Delta Electric Co Inc	Williston, VT	6,000
Resolution Distribution Center	Williston, VT	60,000
First Choice Rentals	Williston, VT	32,000
Circuit City	Williston, VT	27,670
York Capacitor	Winooski, VT	11,700



## DESIGN/MANAGEMENT PROJECTS

Design and implement Energy Audit Programs Kansas State Energy Office

Management and Training Services (Residential Audits) Johnson and Dix Oil Company, Ascutney, Vt.

Design and Specification Services to Franklin Pierce Law Center for a Computerized Central Control System

Coal Conversion Design/Specification for Brattleboro Community Planning, Eight Buildings

Design/Specification for a Steam line link between two central plants and Hydronic Heating System for St. Anselm College, Manchester, N. H.

Design/Specification services to Bellows Falls Union High School, Bellows Falls Middle School, Saxtons River School, Thetford Elementary School, and Westminster School for Computer Based Energy Management Systems.

Pneumatic controls renovation and computerized energy management system specification for Grafton County Courthouse saving 40% electrical and 50% fuel use.

Energy Management services including maintenance of electric, electronic, and pneumatic controls to commercial, institutional and government buildings.

Design/Specification services to Hawthorne College for hot water heating system coal conversions and central computer control systems (5 buildings).

Design/Specification services to Ascutney Mountain Resort for the hotel hot and chilled water HVAC system.

Design/Specification construction management of diesel cogeneration and hot water heating systems: Bellows Falls Union High School and Lebanon Waste Water Treatment Plant

Design/Specification of hot water HV conversion from electric heat to oil fired hot water with optional future wood chip capability at Springfield High School - 160,000 sq ft.

Demand Side Management Consulting to electric utilities: Central Vermont Public Service, Vermont Electric Coop, Washington Electric Coop, Citizens Utility

Bete Fog Nozzle - analysis of shell room dehumidification and foundry heat reclaim.

Blodgett Apple - analysis of refrigeration renovation options for 110,000 bushel controlled atmosphere storage facility.

Central wood chip burning plant assessment and design for six buildings at the Mountain School of Milton Academy including underground hot water heating distribution system.

Design/Specification services for oil to wood chip conversion including replacement of boilers and domestic hot water heater for 153,000 square foot Hartford High School and Hartford Vocational Center, Hartford, Vermont.

Lighting renovation design for Rockingham Central School, Bellows Falls Middle School, Springfield High School, Upper Valley Food Coop, Westminster Center School, Black River Union High School, Ludlow Elementary School, Mt. Holly School, Plymouth Elementary School, Bellows Falls Union High School, Mt. Mansfield Union High.

HVAC controls design for Greater Rockingham Area Services, Inc., Hospital Court, Bellows Falls, VT.

Hot water solar system design for Stagecoach Transportation Services, Inc., Randolph, VT

Heating and weatherization renovation design, controls installation Taylor Palmer Insurance, Bradford VT

Design/Specification services for electric to wood chip heating conversion, HVAC, plumbing, and electrical renovations for 120,000 square foot Mt. Mansfield Union High School and new

30,000 sf addition, Jerico, Vermont.

Design/Specification services for HVAC, plumbing, and electrical renovations including all HVAC unit replacement, new chiller, duct replacement for indoor air quality, complete lighting replacement for 120,000 square foot Missisquoi Valley Union High School and new 30,000 sf addition, Swanton, Vermont.

Design/Specification services for HVAC, plumbing, and electrical for Conte addition to the Montshire museum of Science

Air and water environmental testing for Richmond School, Hanover, NH, Windsor Supervisory Union, Chelsea School, and Saxtons River school

Lighting, HVAC and refrigeration renovation design for Hanover Coop Food Stores.

Contracted energy management for Hanover Consumer Cooperative stores

Energy management system and boiler replacement design for Greenland Central School (NH)

Controls upgrade and boiler replacement design for Newington Public School saving 50% of heating fuel

Geothermal heat pump design for greenhouse with climate battery system - Vershire VT

Pellet boiler design/specification at Esteyville School, Brattleboro VT

Energy Management System design for Academy School Brattleboro VT

Heat pump performance analysis with hourly simulations and load shape projections for Alaska Power and Telephone

## Process and Environmental Experience

### **Types of systems and processes analyzed and /or specified:**

Boiler Plants	15-125 psig over 500 Hp, Gas, oil, coal, wood, electric
Steam	Heating, pumps, turbines, autoclaves
Salt Baths	Heat treating
Dehumidification	Shell rooms, swimming pools, desiccant and refrigerant
Air compressors	Machine operation, painting, pneumatic control, snow making
Electric ovens	Over 500 kW for paint drying and enameling
Vacuum furnaces	Heat treating and as replacement for salt baths
Gas furnaces	Continuous and batch enameling and foundry shell firing
Induction melting	For investment casting operation
Refrigeration	Dairy, food warehousing, supermarkets, compressor and absorption
HVAC	Terminal reheat, multizone, dual duct, induction
Motors to 300 Hp ski lifts	Pumps (water, sludge, air), fans, machining, snow making, centrifuges,
Heat reclaim	Incinerators, boiler, furnace, refrigeration
Cogeneration	Diesel and steam turbine
Environmental	Testing - CO <sub>2</sub> , CO, volatile organic compounds, particulates, microbiological, electromagnetic pollution, noise, lighting, humidity, temperature
Lighting	Analysis and design of fluorescent, metal halide, high pressure sodium, LED renovations and new construction.

Geothermal

Ground water heat pump systems for space heating and cooling.

# RESUME

**Christopher Hebb**  
**Project Engineer**

Five years experience with CD Willey Mechanical & Electrical Contracting.

Thirty-five years experience with Dynamic Integrations LLC in commercial, institutional, and industrial energy management. Responsibilities include mechanical and electrical engineering, program design, project management, client liaison, and general business administration. Company owner and president.

## EDUCATION

Beloit College and University of Oregon

Member: Association of Energy Engineers, Certified Technical Energy Analyst, New Hampshire. Certified in DDC, Pneumatic, HVAC Systems Controls by Tempcon Inc.

## WORK EXPERIENCE

Project engineer, New Hampshire and Vermont Institutional Conservation Program providing audit procedure design, including data analysis and report production. Instructor for over 25 auditors and primary consultant to the auditors, providing cost estimates and procedures for estimating savings for improvements in all areas of energy use, over 1,000 buildings audited.

Investment grade audits including direct consulting or project management of engineering assessment of energy improvement potential for over one hundred schools, hospitals, local government, and light commercial buildings. Developed a multizone building energy simulation program based on the ASHRAE TC4.7 procedures to provide accurate estimates of savings and financial analysis.

Training and seminars: provided energy management training for commercial, institutional, utility clients and most recently a lighting and energy auditing seminar for Northeast Sustainable Energy Association.

Construction manager for installation of energy management systems at two Rich's department stores, specification of numerous electric, pneumatic, and programmable control renovations. Responsible for programming and troubleshooting energy management systems.

Energy analysis of commercial and industrial facilities including Lebanon Waste Water Treatment Plant, Vermont Castings, Prime Computer, Bete Fog Nozzle, Butterfield Union, Mt. Ascutney Resort, Smugglers Notch Ski Area, Burke Mountain Ski Area, and many retail stores and apartment houses. Specializing in commercial refrigeration and HVAC.

Project engineer for HVAC and cogen conversions replacing 1.4 mW of electric heat. Project engineer for cogeneration plants serving the Lebanon Waste Water Treatment Plant and Bellows Falls Union High School.

Utilities planning study of NH State Hospital, (1.5 million SF) and cogen facility including steam turbine performance optimization developing \$1.8 million annual savings with 6 month simple pay back.

Commercial and industrial sector demand side management program analysis, measure screening and program projections for Vermont Electric Coop, Washington Electric Coop, and Citizens Utilities. Measures totaling \$9 million. This work required sample site surveys of each sector and extensive analysis of each sector.

Design of fifteen solid fuel boiler plants. Including wood chip heating at Mt. Mansfield Union High School, The Mountain School -Vershire VT, and Hartford High School.

Lighting design for fourteen schools.

Vermont Act 250 Energy Inspector (3 years) data collection and analysis of Vermont's commercial and industrial new construction for code compliance assessment and to establish a baseline for new energy codes. Developed forms and procedures to assess compliance with ASHRAE 90.1-1989.

Facilities management software development for A. Cook Associates (2001-2004) serving supermarket chains including Food Lion, Hannaford, Ralphs, Safeway, Shaw's, Harp's Market, Lowes Foods, Price Chopper, P&C Foods, Raley's, Schnucks and Star Market. Developed refrigeration equipment maintenance management procedures and refrigerant tracking applications to meet EPA requirements.

Reviewed for approval American Recovery and Reinvestment Act Block Grant \$3,000,000 guaranteed savings agreement for Kearsarge School District. (currently in construction).

Energy Management services including contracted maintenance of electric, electronic, and pneumatic controls for Grafton County Courthouse, Cottage Hospital, Thetford Elementary School, Westminster Central School, Putney Central School, Springfield Union High School, Hanover Consumer Cooperative stores, Bellow Falls Middle School.

HVAC and lighting analysis of the new 100,000 SF FBI office building at Kapolie, Oahu, Hawaii.

Transportation - 20 years on technical staff of the American Tour de Sol, an annual solar electric, battery electric, hybrid, and alternative fueled vehicles educational road rally organized by NESEA (Northeast Sustainable Energy Association).

Controls design and installation for the Orange County Courthouse, Chelsea VT.

Currently providing ongoing contracted energy management services to Bellows Falls Union High School and mechanical consulting to Windham Wood Heat Initiative.

Member – Thetford Energy Committee

Certified operator – Thetford Hill , N. Thetford, E. Thetford water systems