NORTHEAST USA

INTEGRATED SCIENCES BUILDING

Preliminary Presentation Outline

Presentation Example Slides

March 25th, 2011

Christopher S. Putman | Mechanical Option
Faculty Advisor | Dr. William Bahnfleth

I. Title Slide (1)
   i. Timeline Synopsis
II. Introduction
   i. Building Information (3)
      a. Location, Size, Contractors, Renderings, etc.
   ii. Existing Systems Overview (2)
   iii. Information on Energy Consumption vs. TRACE Simulation (1)
III. Mechanical Depths
   i. Variable Primary Flow vs. Primary Secondary
      a. Intro – Reason for Study, Expectations, etc. (1)
      b. Schematics (2)
      c. Analysis
         - Pump Curves (2)
         - Energy Comparison (1)
      d. Cost Analysis (1)
   ii. Thermal Storage
      a. Intro – Reason for Study, Expectations, etc. (1)
      b. System Sizing (1)
      c. Schematic (1)
      d. Analysis
         - Chiller/Cooling Tower Simulation Explanation (1)
         - Energy Comparison (1)
         - Advantages/Disadvantages (1)
      e. Construction & Logistics Information
         - Location of Tanks (1)
         - Construction Issues & Schedule Impacts (1)
      f. Cost Information (1)
IV. AE Breadth
   i. Solar Photovoltaic Feasibility Study
      a. Reason for Study (1)
         - System Sizing & Schematic (1)
      b. NREL Data & Electricity Production (1)
      c. State & Government Incentives (1)
      d. Cost & Payback (1)
V. Acknowledgments (1)
VI. Questions (1)

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Project Information

Size | 133,847 Square Feet

5 Stories Above Grade
6th-Level Mechanical Penthouse
Partial Basement

Occupancy | Educational & Research Laboratory
Construction Cost | $52.1 million
Construction Schedule | October 2009-July 2011
Delivery Method | Design-Bid-Build

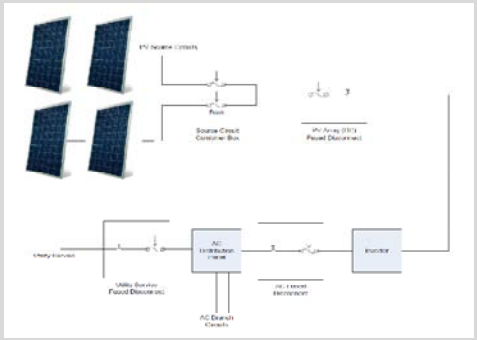
BUILDING INFORMATION

Architecture

- LEED Gold Certification
- 4-Story Bio Wall Air Filtration feature
- 240-Seat Auditorium
- Cutting edge Laboratories & Science Classrooms
- Ground Floor Café
- Recycled Stone Exterior Cladding

Project Team

Owner | Information not for Publication
Architect | Diamond + Schmitt Architects, Inc.
Associate Architect | H2L2 Architects & Planners, LLC
General Contractor | Turner Construction Company
MEP Engineer | Crossey Engineering, Ltd.
MEP Engineer | Spotts, Stevens, & McCoy, Inc.
Structural Engineer | Halcrow Yolles Ltd.
Associate Structural Engineer | Keast & Hood Co.
Civil/Landscape | Stantec Consulting Services, Inc.



Solar Photovoltaic System

Financial Incentives

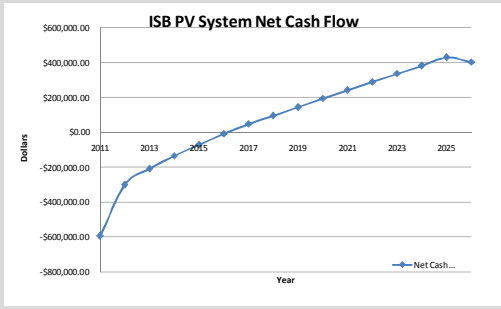
- **MACRS (Modified Accelerated cost Recovery System Depreciation Tax Deductions)**

MACRS (Modified Accelerated Cost Recovery System Depreciation Tax Deductions		
Depreciation Year	Net System Cost	$393,288.00
2011	10.00%	$13,765.08
2012	32.00%	$44,048.26
2013	19.20%	$26,428.95
2014	11.52%	$15,857.37
2015	11.52%	$15,857.37
2016	5.76%	$7,928.69

- **Pennsylvania Sunshine Solar Rebate Program**

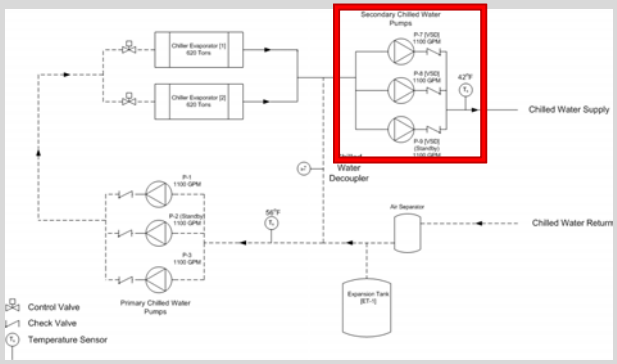
Pennsylvania Sunshine Solar Rebate Program			
	Rebate $/kW		Rebate Amount
First 10kW	$0.75	$	7,500.00
Next 70kW	$0.50	$	35,000.00
Total		$	42,500.00

- **Pennsylvania Public Utilities Commission – Solar Alternative Energy Credits (SEAC)**
  - Up to $39,772.00 Annually
- **Federal Renewable Energy Production Incentive (REPI)**
  - $0.013/kWh (Adjusted 1993 USD) for first 10 years
- **Federal Energy Investment Tax Credit (ITC)**
  - 30% of Initial Investment
  - $191,000.00



- **System Cost Estimate**
  - **Panel Cost**
    - $680.00 per Module x 348 Modules = $236,400.00
  - **Installation Cost**
    - $5.00 per Watt x 80,000W = $400,200.00
  - **Total System Cost**
    - $636,840.00

Original System – Traditional Primary-Secondary



VARIABLE PRIMARY FLOW SYSTEM

Immediate Benefits

- Fewer Pumps
- Less Pumping Energy
- Reduced Annual Electrical Consumption
- Low ΔT Tolerance

Drawbacks

- Control Stability & Reliability
  - Open Loop Control Based on Inlet temperature
- Variable Flow Chiller Capability
  - New Chillers can Handle ΔV
- Typically Overhyped
  - Proven with Parametric Study

New System – Variable Primary Flow