

# **Financing Solar: Regional Examples**

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# BASICS OF A SOLAR PV SYSTEM

- **Utility Grid** - the network of distribution wires used by the local utility company
- **Solar Modules** – converts sunlight into electricity
- **Inverters** - changes the direct current (DC) produced by the modules to an alternating current (AC) used in homes and buildings
- **Electrical Room (Panels)** – solar's connection point to utility grid that distributes electricity to the facility
- **Utility Meter** - measures the flow of electricity between the facility and the grid



- **Monitoring Software** - tracks the performance/production of the solar system

# TYPES OF SOLAR INCENTIVES

- Federal income tax credit (ITC)
- Accelerated equipment depreciation (MACRS)
- State rebates and grants
- State renewable energy credits (RECs)
- State renewable energy payments (REPs)
- State performance-based incentives (PBI's)
- State income tax credits
- Property tax and Sales tax exemptions
- Utility sponsored loan programs

# FEDERAL ITC

- 30% investment tax credit to system price  
AFTER all other incentives
  - Becomes 10% after 12/31/08
  - Likely to be renewed after presidential election
- Used by the customer or the PPA investor as the basis of most sales
- Special rules dictate financing options

# DEPRECIATION

- 2008 Economic Stimulus Package allows a one-time 50% deduction in Year 1
- 5-year MACRS schedule applies to remaining balance
- Can be used by client if purchasing, or PPA investor
- Accounts for over 20% of system price

# DEPRECIATION'S ROLE IN FINANCING

## Federal:

### Section 179 Deduction Allowance

Up to \$250,000 immediate deduction, a 50% bonus depreciation in Year 1 on adjusted value, plus the normal depreciation schedule on remaining adjusted value.

### Solar qualifies for the 5-year MACRS depreciation schedule

Year 1: 20%	Year 4: 11.52%
Year 2: 32%	Year 5: 11.52%
Year 3: 19.2%	Year 6: 5.76%

## State:

Varies by states. See Sun Net Zero state guideline documentation for details.

## Overall:

*Depreciation will reduce the total cost of a solar system by your corporate tax rate.*

# MASSACHUSETTS INCENTIVES

- Maximum System Size Supported by Rebate : 500kW
- Maximum Benefit per Project : \$1,200,000
- Rebate Breakdown:
  - First 25,000 Watts (25kW) : \$3.25 per W
    - “adders”:
      - \$0.25 per W for MA manufactured solar modules and inverters
      - **\$1.00 per W for public buildings**
    - Next 75,000 Watts (75kW) : \$2.50 per W—same “adders”
    - Next 100,000 Watts (100kW) : \$2.00 per W—same “adders”
    - Next 300,000 Watts (300kW) : \$1.50 per W—same “adders”
  - Renewable Energy Credit (REC) Value:
    - Alternative Compliance Payment (ACP) for 2008 = \$58.58
  - Systems are exempt from property taxes

# STATE GRANTS & REBATES

- State support is critical to the sale of solar technologies
- Grants are most often demonstration funds awarded to only a few recipient applicants
- Rebates are replicable general fund programs to promote more public sales
- Rebates typically have rules such as caps, \$'s/kW, geographically requirements, etc.

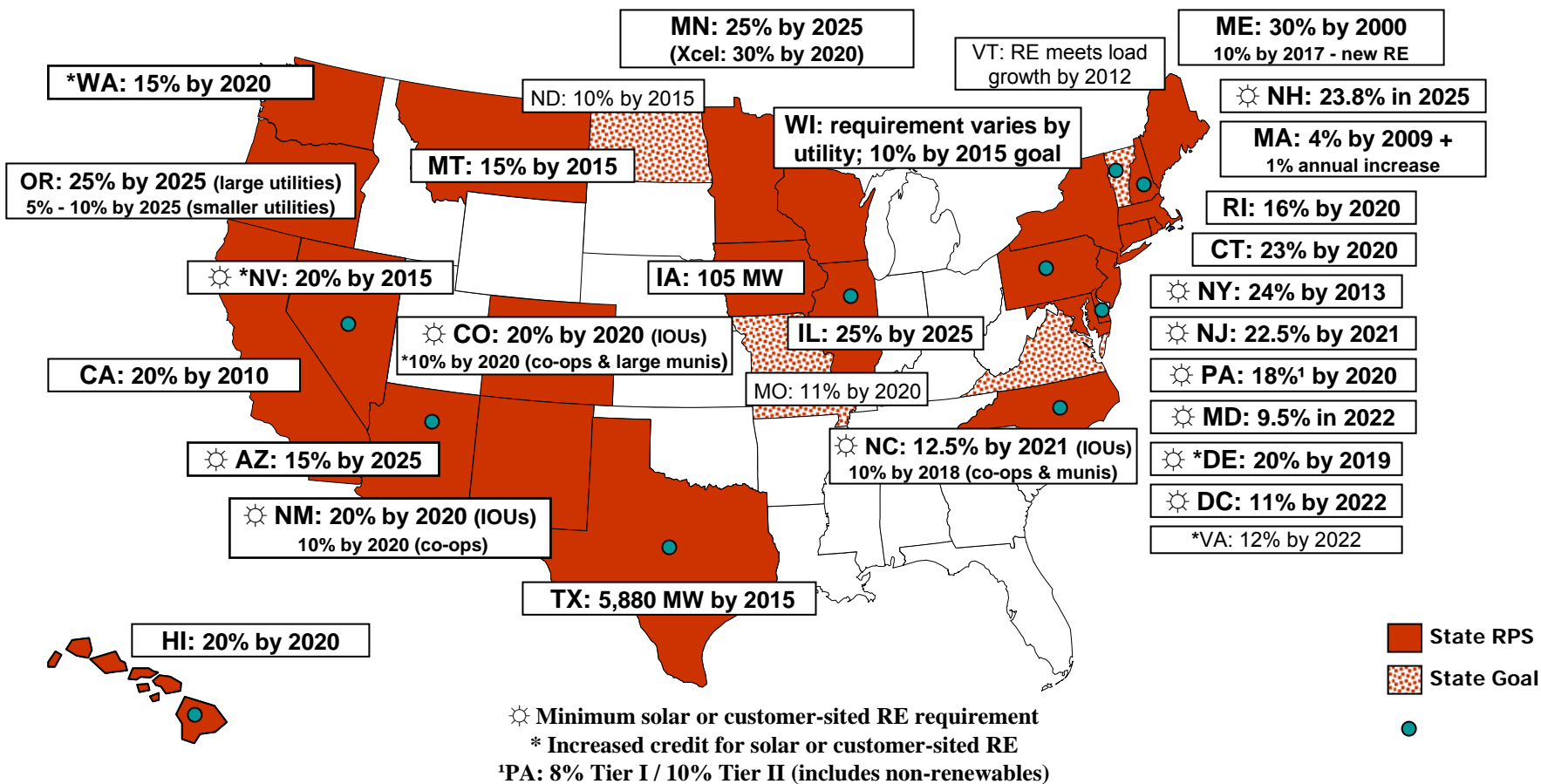
# RENEWABLE PORTFOLIO STANDARDS (RPS)

- State standards & production targets that utilities are required to fulfill annually
- Monetary penalties for non-compliance
- Green power is measured in RECs (renewable energy credits)
  - 1 REC is produced for every 1000 kWh's generated by a renewable technology
  - REC values vary greatly by state & source
  - REC values are negotiated directly w/utilities and are based off a % of the penalty for non-compliance

# 2008 RPS BY STATE

DSIRE: [www.dsireusa.org](http://www.dsireusa.org)

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# RECS, REPS, & PBI'S

- All are payments made to solar owners based on the electricity produced by each installed system
- REC programs are utility mandates to include solar power in their power mix
  - REC values are based on the negotiating ability of each system owner
  - REC values are lower than the penalty paid by the utility for legal non-compliance which is set by the state
- REP programs pay system owners a fixed premium price for each kWh produced for 20 years (European model)
  - Eliminates the need to offset an existing load
- PBI programs are net metered REP's (offsets ex. load)

# MISCELLANEOUS INCENTIVES

- State income tax credit
  - Similar to Federal ITC
  - Typically 30-50%
- Property tax exemption
  - Typically offered for 20 years
- State sales tax exemption
  - Many states do not tax the sale of solar technologies

# SPECIFIC FACILITIES TO TARGET

- Manufacturers
- Food Processors
- Distribution Centers
- Big Box Retailers
- County Ice Rinks & Rec. Centers
- Data Centers
- Printing Presses & Newspapers
- Schools with multiple buildings

# QUICK QUALIFIERS

- Does the occupant company own the facility or lease it long-term (10+ years)?
- Is there a significant energy load being used?
- Can they afford an “expensive” system?
- Will a third-party investor consider them a worthy credit risk for financing?
- Do they have a green mantra or a sustainability mandate?

# WHAT ARE YOU REALLY SELLING?

- Long-term energy savings
  - Invest up-front today to avoid tomorrow's higher utility bills
- Tax shelter that provides rapid recoup of investment
  - Tax credits (federal & state)
  - Accelerated depreciation schedules
  - State 'green' incentive payments
- Attractive IRR's (internal rate of return)
- Increase in property valuation
- A predictable on-site power source
- Reduction of carbon footprint

# WHAT WILL SELL THEM?

- Zero capital costs to purchase (PPA)
- Long-term hedge against energy inflation
- Fits with company and market's 'green' directives and obligations
- Quick implementation time schedule
- Potential to offset tax obligations and better margins using rapid depreciation
- No additional paperwork to handle
- Solid payback period, IRR (8%+), and increased resale value of property

# SO WHY SOLAR?

- 1) It is the easiest renewable energy technology to implement as it can be installed anywhere the sun shines uninterrupted for more than  $\frac{3}{4}$  of each day
- 2) With incentives on-grid applications are very cost competitive with utility power
- 3) Off-grid applications are usually the least expensive option available
- 4) It can be located on rooftops, in parking lots or on open ground locations
- 5) It does not require any permitting or zoning changes
- 6) It has no moving parts and requires little maintenance
- 7) It is long lasting with a 25-year manufacturer warranty
- 8) It will generate electricity for up to 50 years
- 9) On rooftops they will protect roof membranes from UV light damage, extending the life of underlying roofing systems
- 10) It does not require penetration of roofing membranes (ballasted solutions)

# CLIENT PURCHASE OPTIONS

- Buy as an up-front capital investment
  - Favorable to companies with lots of cash and profits with a tax appetite
- Lease the system as a capital cost
  - Only feasible in select states due to tax credit rules and ramifications
- Purchase the system's electricity via a Power Purchase Agreement
  - Most common due to zero capital outlay and solid foundation with IRS rule makers

# **POWER PURCHASE AGREEMENTS (PPA'S) & FINANCING ALTERNATIVES**

# ADVANTAGES 3<sup>RD</sup> PARTY FINANCING

- Third party can use flexible financing options / structure and have access to the full range of financial incentives
- Faster deployment of solar systems
  - The analysis is performed by a team that understands how to streamline the process while maintaining quality (i.e., “heavy lifting”)
- Supply chain and installers have already been approved
- Avoid upfront capital costs
  - Site only pays for the energy produced by PV systems

# TYPES OF FINANCING PRODUCTS

- **Solar Host Agreement (SHA) and Power Purchase Agreement (PPA)** – long-term contract for electricity and for customers who cannot take advantage of tax credits.
  - Safest arrangement relative to IRS rulings on solar ITC and MACRS
- **Finance Lease** - principal method of financing and strongly similar to conventional bank financing, only more flexible
- **Operating Lease** - when customers cannot take advantage of tax credits, or when they want to pay for a system with operating dollars, not capital dollars (accounted for as a rental expense)
- **Tax Exempt Lease Purchase** - reduced interest rate financing for government and government partnered non-profit entities who wish to own their solar system

# SHA/PPA FINANCING BASICS

- Upfront capital costs are borne by a third party entity
  - Building / site pays **only** for energy produced by the renewable energy system—no production means no payment.
    - Building “owners” and third party developers negotiate the rate to be paid for each kWh produced by the solar system over a set term...a power purchase agreement (PPA) is the result
- Third party is **responsible** for design, build, monitoring, maintenance, and overall performance of system.
  - 3<sup>rd</sup> parties integrate the various revenue streams into a single financing package that provides a set rate of return for their investor

# POWER PURCHASE AGREEMENT (PPA)

## What it is

- A contract with pre-determined \$/kW pricing for actual electricity consumed
- Good structure for government entities who do not want or cannot purchase a system
- Corporate entities can also utilize
- Limited responsibilities other than purchasing energy for End-Users

## Typical Terms

- 250+ kW system; 10-20 year payback schedule
- More stringent credit & “due diligence”
- At end of term options include 1) Renew PPA, 2) Purchase System, or 3) Pay termination fee and have system removed
- Highest transactional costs

# RUNNING THE NUMBERS

Seeking Rates of Return relative to negotiated per kilowatt production charge

## Costs:

- Total Capital Costs—fully installed
- Roof maintenance and replacement schedule
- Operating Costs, maintenance, insurance, etc. (of PV)

## Revenue Streams/Value:

- Federal Tax Credit (30% of costs)
- Accelerated Depreciation (5 yr.) + 50% bonus depreciation for 2008
- State/Local rebates, grants, and tax incentives
- Energy Production of the Solar system
  - Current Price of Energy—local rates
  - Projections for future energy prices

## RECs and Carbon Credit Values:

- RPS implications--Carbon tax/cap & trade

# PPA TARGETS / ELIGIBLE BORROWERS

- Hospitality
- Retail
- Hospitals
- Industrials
- Manufacturers
- Schools
- Any credit-worthy entity
- Federal Government
- State
- Local
- Public schools
- Public hospitals
- Special authorities

# TYPICAL PARAMETER FOR POSITIVE IRR

- Full utilization of Federal tax credit + MACRS
- State rebate, production incentive, or RECs
- Greater than \$0.12/kWh electricity rate
- Historical rate increases / expected rate increases
- Solar “friendly” roof / site for the installation

# WHAT IS A LEASE?

- Finance contract between 3 parties
  - Lessor, Lessee & Vendor
- Looks like either a Loan or a Rental
- Ability to transfer ownership benefits
  - Tax credits
  - Depreciation
- Specified term and payment
- Many types of leases

# ESTIMATION FACTORS

- Cost of materials
- Cost of labor
- Difficulty of work site
- Cost of maintenance
- Production value of system
- Price of electricity (utility company)

# SOLAR PRICING FACTORS

- Amount of un-shaded Roof space (9am-4pm)
  - Dictates maximum size of PV array
  - Larger systems have lower costs per installed kW
- Number of roof penetrations
  - Working around penetrations increases costs
- Height of roof
  - The higher it is, the more it will cost
- Ease of access to roof...staging area and M&O
- Structural capacity of roof
- Condition and age of roof

# Montgomery County Maryland Public Schools—Solar RFP

- May 2008: Request for Proposal for 1.4 MW of PV capacity (1400 kW)
- Seeking Third Party Funded “offers”
- RFP Winner:
  - Sun Edison for \$0.095 per kWh
  - Won by an unusually wide margin
  - Low bid is not always the “best” choice
  - Keeping roofing warranties intact should be #1

# CASE STUDY: FORT BENNING, GEORGIA

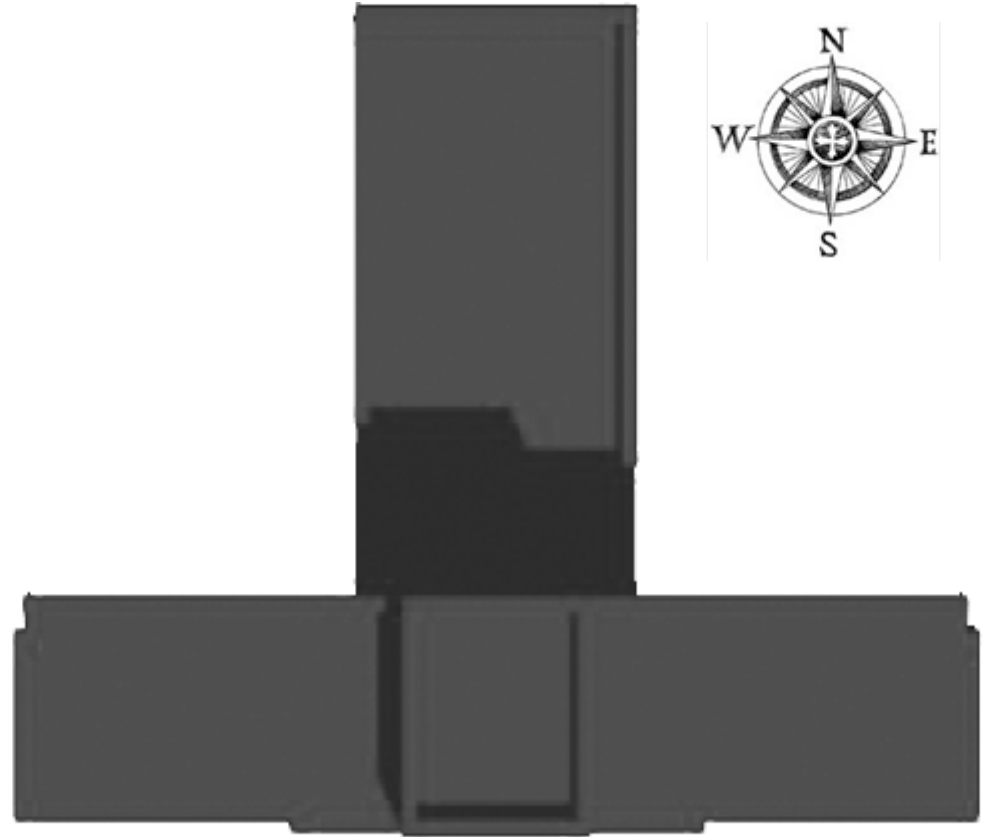


# PROJECT DRIVERS

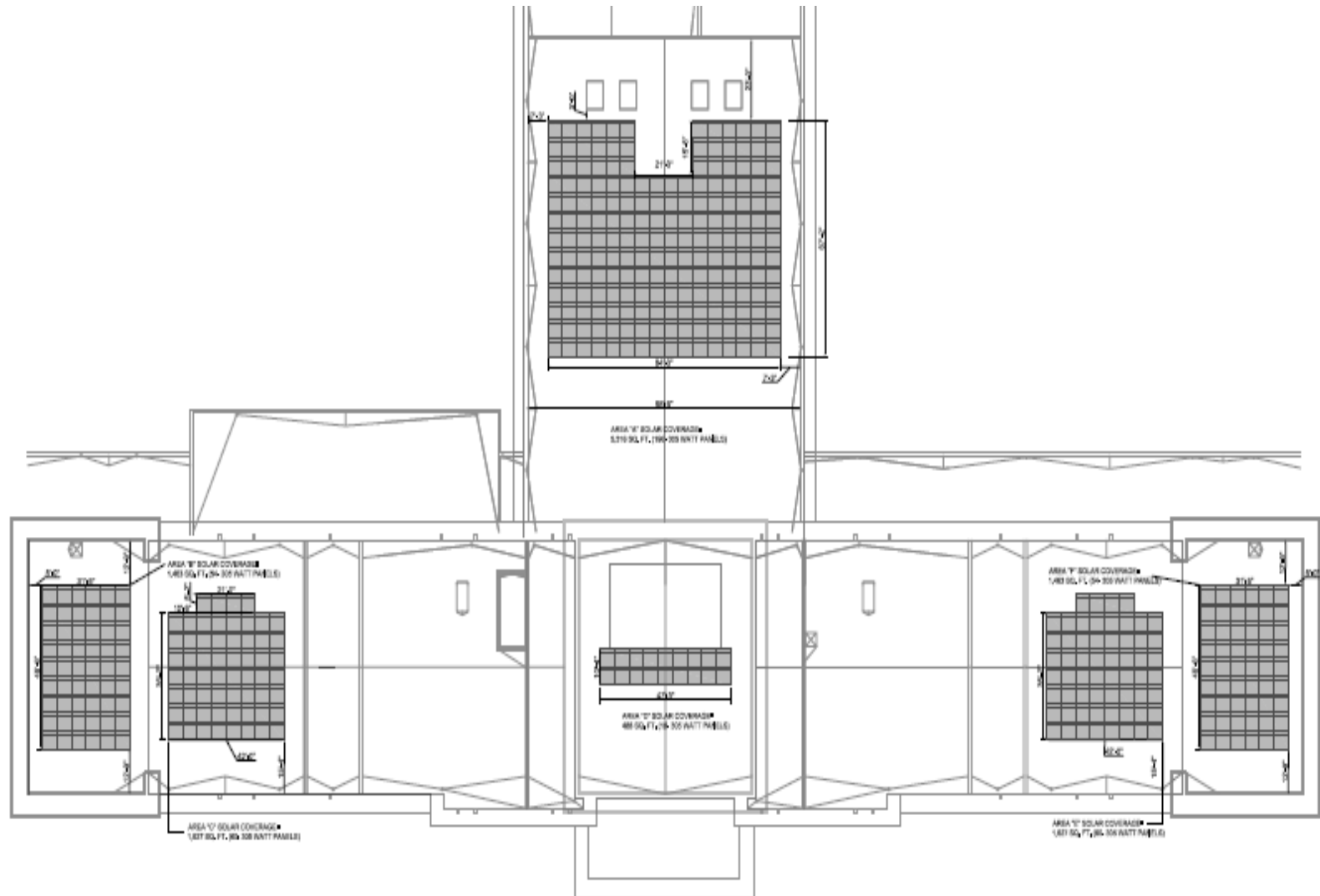
- Army's goals:
  - LEED Silver Certification
    - Needed points that don't require changing operations
  - Mandate for on-site renewable energy generation
    - Energy security issue
  - Explore 3<sup>rd</sup> party project ownership model
  - Integrate solar into base redevelopment plans
    - Carry experience to base renovation plans throughout U.S.

# FT. BENNING SHADING

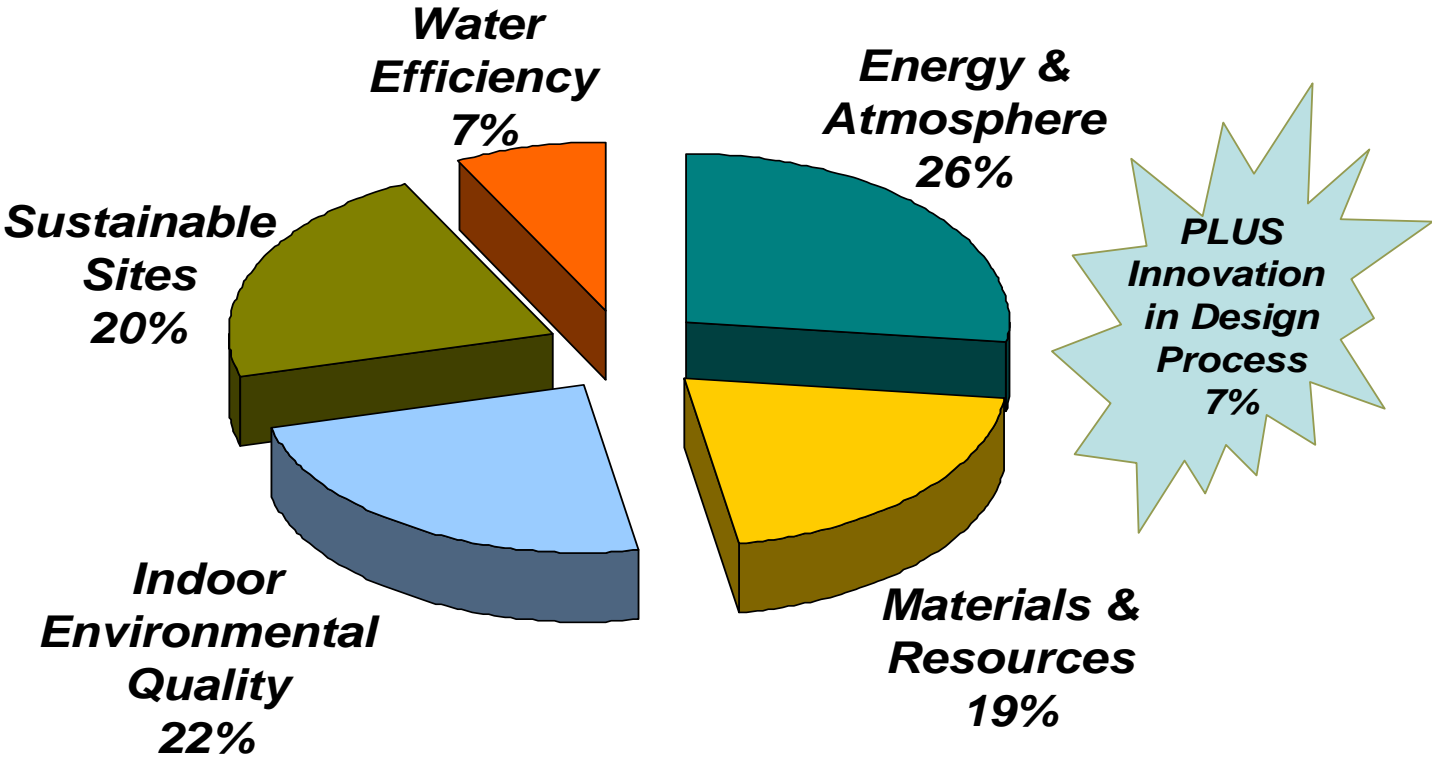
- Maximum shading of rear roof section on December 21<sup>st</sup> at 11 am
  - the shortest day of the year
  - Sun is lowest and casts longest shadows



# FT. BENNING MODULE LAYOUT



# LEED NC POINT DISTRIBUTION



## 5 “CORE” LEED-NC Credit Categories (Point Distribution By Percentage)

# LEED ON-SITE RENEWABLE ENERGY

LEED On-Site Renewable EA 2 Credit Scale	
% Renewable Energy	Points
2.5%	1
7.5%	2
12.5%	3

# TA'S SALE ADVANTAGES

- Largest national commercial roofing company
  - Bonding and insurance
- Installation expertise
  - Repair and peace of mind
  - Safety rating
- Pricing
  - Mention the ability to buy in volume
  - Essential for non-residential contracts
- Warranty provisioning & support
  - New, repaired, and bundled with solar