

White Tag™ Certificates - Trading Energy Efficiency as a Commodity



February 20 , 2007

Sterling Planet



Renewable Energy
Solar. Wind. Water. Bioenergy.

Topics

- Sterling Planet
- Renewable Energy Certificates (REC) or Green Tag
- Energy Efficiency Certificates (EEC) or White Tag™
- Carbon Credits
- Economics
- Residential Market



Sterling Planet

- Founded January 2000 in Atlanta (w/ 8 regional offices)
- First nationwide renewable energy marketer
- Sold almost 10,000,000,000 kWh of renewable energy
- Nation's leader in renewable kWh sales
- Almost 40 utility partnerships - most in the renewable industry
- Over 400 commercial and institutional customers
- Leading the emerging White Tag™ market



Products & Services

1. Market Renewable Energy Certificates (REC)
2. Create and Market White Tag™ Certificates
3. Manage Residential Green Power Programs (Utility Partners)
4. Develop Off-site & On-site Renewable Energy Projects
5. Reduce Energy Use through Information Mgmt & Analytics



Customers

Universities (24)

- Harvard



- Yale



- Duke



- Utah



- Florida State



Government (56)

- US Air Force



- US GSA



U.S. General Services Administration

- US NASA



- US Homeland



- US EPA



Commercial & Industrial (290)

- Alcoa



- DuPont



- Johnson and Johnson



- Pfizer



- Staples



- Nike



Utilities (38)

- Florida Power & Light



- Consolidated Edison



- City of Austin



- City of Tallahassee



- Constellation NewEnergy

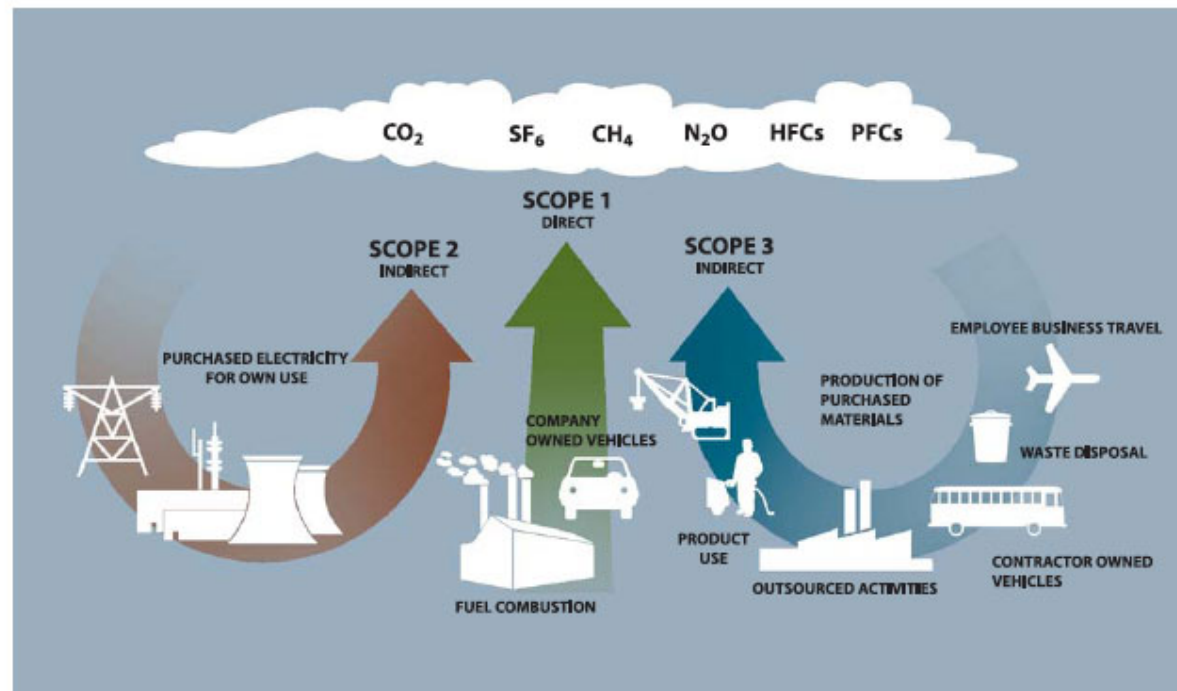


A Member of the
Constellation Energy Group

Environmental Attributes

- Environmental Attributes Market Driven by Greenhouse Gas Reductions
- Market is Evolving, Complex, State-based, Many Stakeholders & Protocols
- Tags viewed as Indirect, Carbon Credits viewed as Direct Reductions

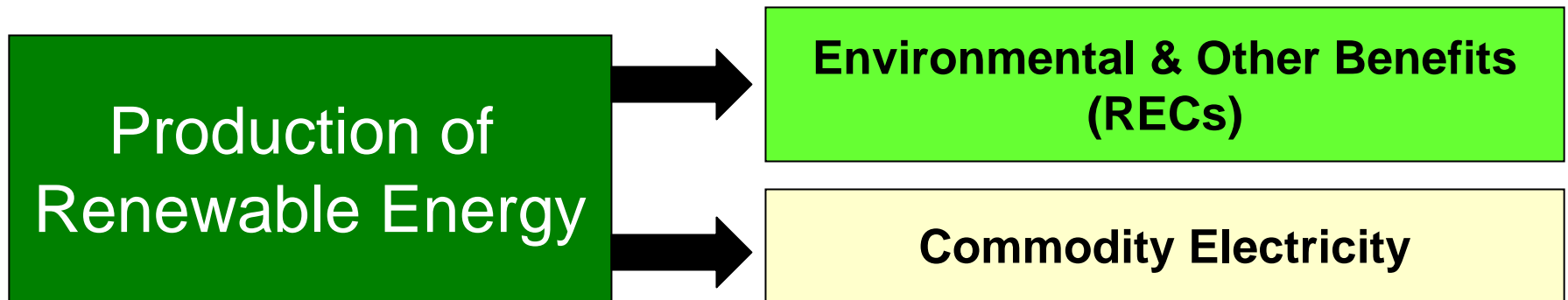
FIGURE 5 | OPERATIONAL BOUNDARIES



Source: New Zealand Business Council for Sustainable Development.

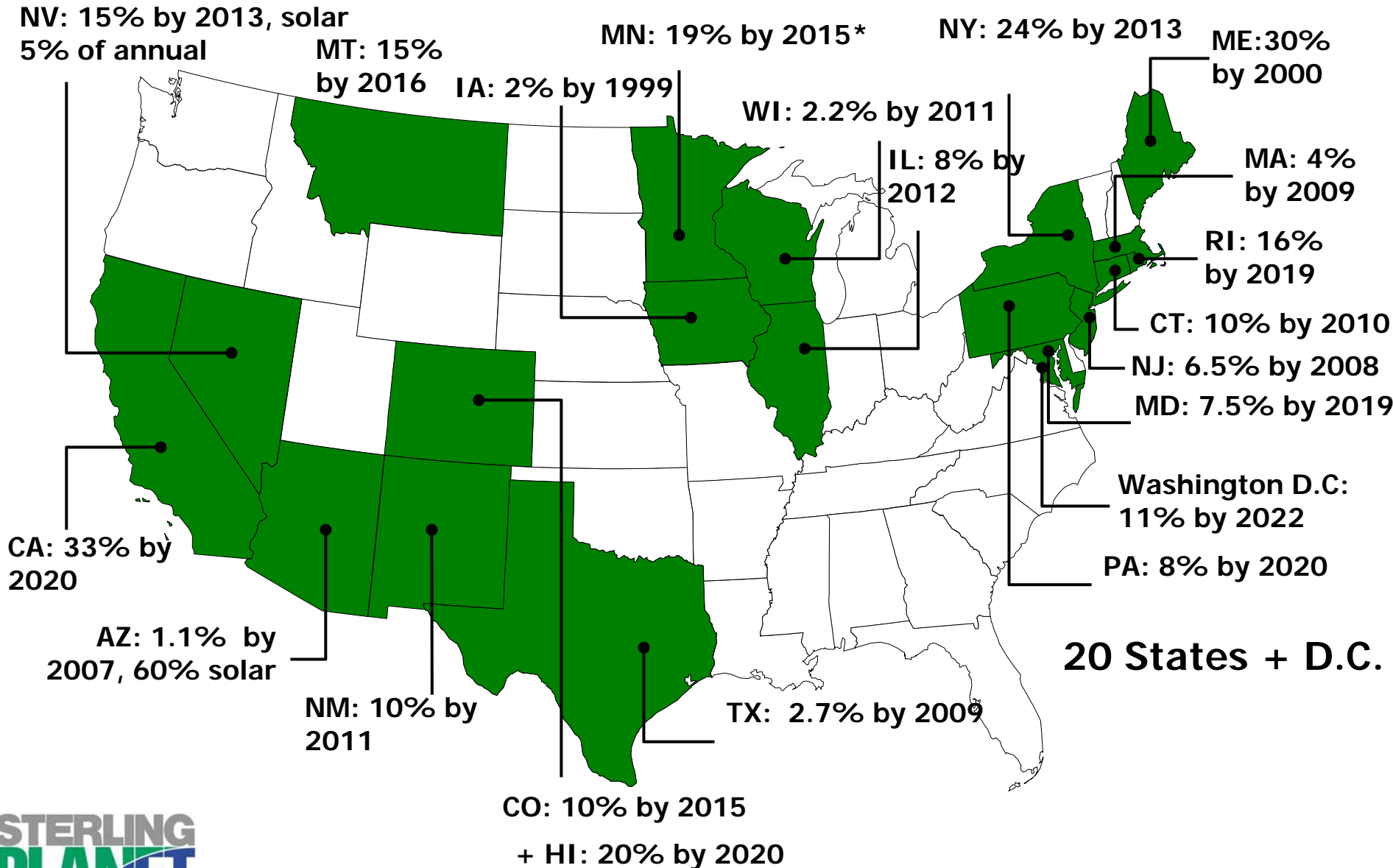
What are Renewable Energy Certificates?

- Certificates represent the contractual right to claim the environmental and other attributes associated with electricity generated from a renewable energy facility. They are traded independently of the energy.



- Also known as RECs or Green Tags (1 MWh = 1 Tag)
- REC Purchases Mandated by State Renewable Portfolio Standards (RPS)
- Retail Electricity Suppliers Must Meet a Percentage of Sales in RECs
- Suppliers Assessed Compliance Prices for Failing to Meet Percentages

Renewable Portfolio Standards



"Voluntary" Market

- RECs represent the contractual right to claim the environmental and other attributes associated with electricity generated from renewable energy. Companies apply these to their Greenhouse Gas (GHG) emissions.



- Bank of America pledges to reduce its total U.S. GHG emissions by 9% from 2004 to 2009.
- Eastman Kodak pledges to reduce total global GHG emissions by 10% from 2002 to 2008.
- Gap pledges to reduce its U.S. GHG emissions by 11% per square foot from 2003 to 2008.
- Marriott pledges to reduce U.S. GHG emissions by 6% per available room from 2000 to 2010.
- Pfizer pledges to reduce global GHG by 35% per \$ of revenue from 2000 to 2007.
- Baxter, IBM, NREL and SC Johnson achieved their ambitious 2000 to 2005 goals.

Market Size



	2004 REC Market Size (10 ⁶ MWhs)	2004 REC Market Value (\$ millions)	2010 REC Market Size (10 ⁶ MWhs)	2010 REC Market Value (\$ millions)
Compliance Market	8-13	\$140	45	\$600
Voluntary Market	3	\$15-\$45	20	\$100-\$300
Total	11-16	\$155-\$185	65	\$700-\$900

Source: NREL Energy Analysis Office

Certification

There are two leading and well recognized non-profit organizations that provide independent certification and verification of RECs:

- Environmental Resources Trust
- Green-e



- Establish and Enforce Protocols
- Certificate Tracking System
- Prevent Double Counting (Sale, Use or Claim)
- Coordination (States, Businesses and Institutions)



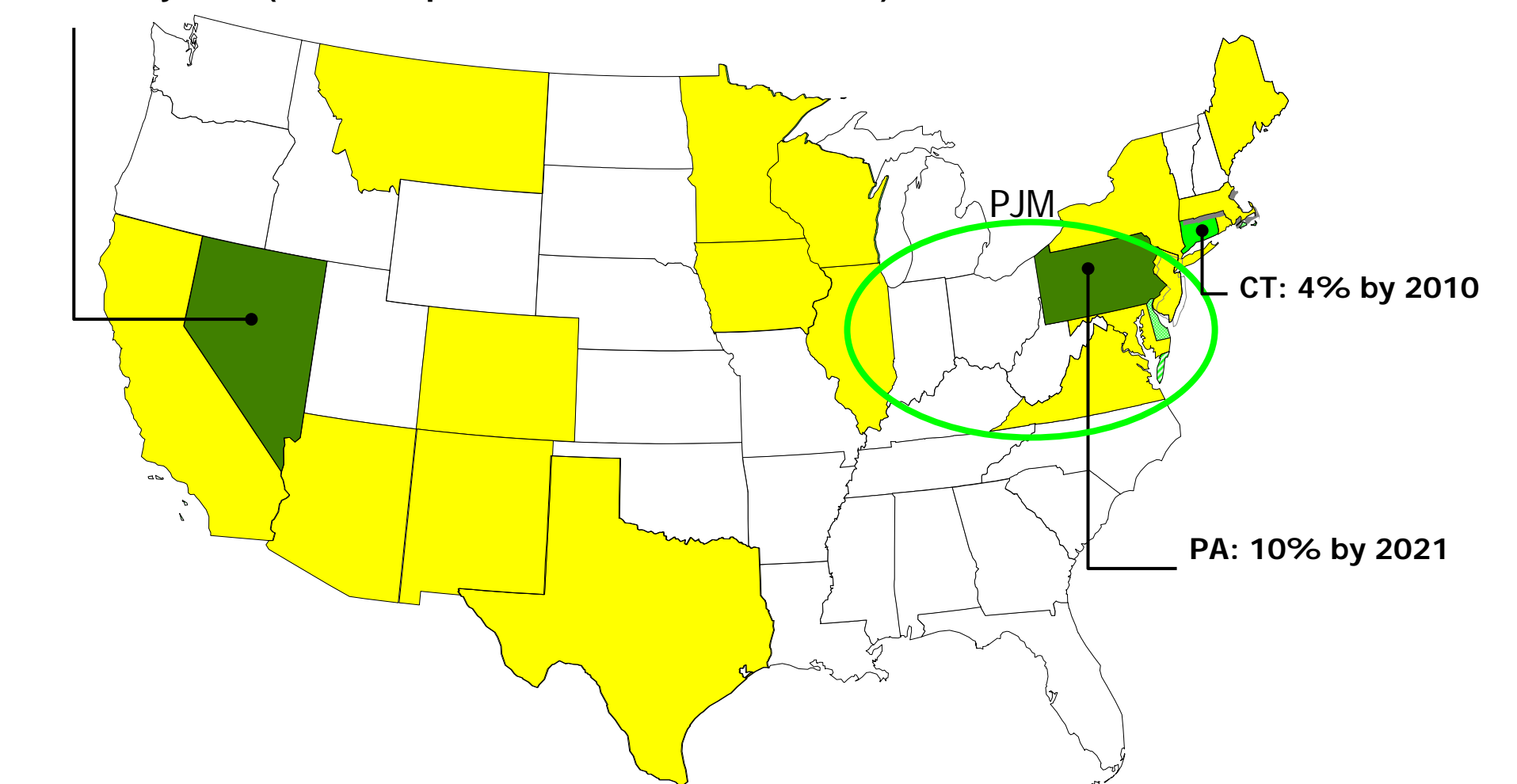
What are White Tag™ Certificates?

- Also known as Energy Efficiency Certificates
- A new tradable attribute similar to RECs
- Represents the value of energy not used (conserved) at facilities
- Created through the implementation of energy conservation projects - demand-side & CHP
- Principally electricity, but can be any energy supply



Portfolio Standards for Conservation

NV: 5% by 2015 (Allowed up to 5% EEC to meet 20% RPS)



■ Today: 3 States + PJM (UK, Belgium, Italy & France)

2-3 yrs: All RPS states plus

Comparison to RECs

White Tag™ Certificates

Many Ways the Same

- Compliance Market - Same States & Similar Mandates (%)
- Voluntary Market - Same rationale, but larger market share (vs mandated)
- Market Size - Similar, but likely larger with broader scope & faster adoption
- Certification - Similar, but more complex (savings vs generation)



Some Ways Different

- Regulations - Facility based, not equipment based
- Measurement & Verification (M&V) - Historically problematic

Regulations

White Tag™ Certificates



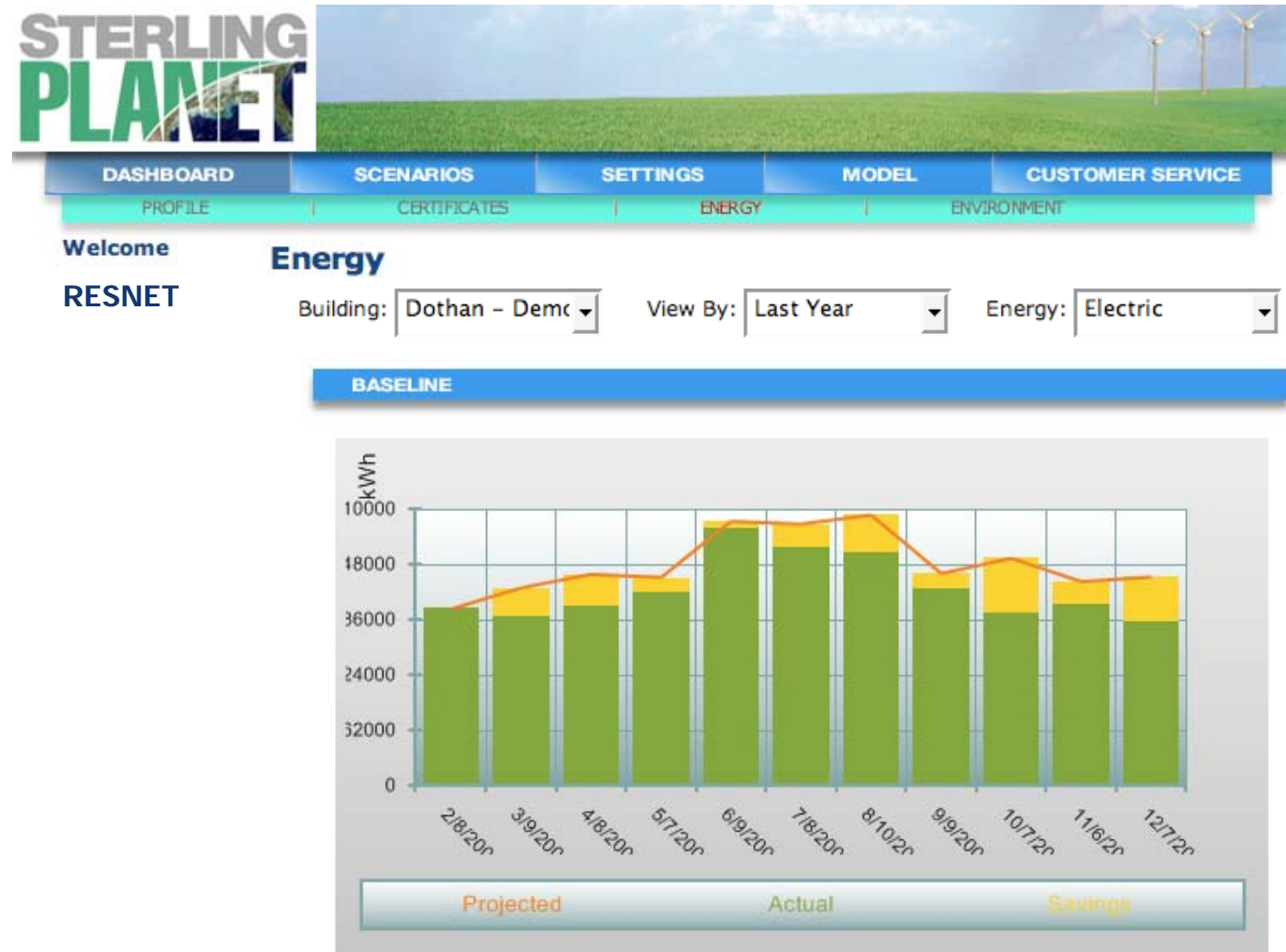
- Owner of facility, not equipment, has title to the tags
- If utility funds project (e.g rebates), utility owns tags
- Demand-side projects must involve physical activity
- CHP projects must achieve 50% efficiency & 20% thermal output
- Projects completed after January 1, 2006 qualify for tags
- Compliance markets begin trading January 1, 2007
- Penalty prices in compliance markets range from 31 to 45 \$/MWh
- Tags have a “vintage” and expire the year after created (+ 3 months)
- Certification requires the approval of a M&V plan

White Tag™ Certificates

- Prescriptive method for direct replacement/retrofit
- Metered method for cogeneration or CHP
- Design method for new buildings (LEED)
- Modeled method for operational changes (existing and new buildings)
 - Requires establishing a baseline (actual building or reference)
 - Traditionally used facility simulation models or statistical models
 - Facility: on-site, complex, expensive, subjective - but accurate
 - Statistical, off-site, simple, inexpensive, objective - but inaccurate
- Sterling Planet has developed neural network model - best of both



M&V: WhiteTag Pro™



- Neural Network
- Online System
- Large Portfolio
- Baseline
- M&V
- Scenarios
- Track
 - Energy Use
 - Tags
 - CO2 (GHG)
 - NOx & SO2
- Database (I/O)
 - Building
 - Billing
 - Weather

What are Carbon Credits?

Direct Offset of Carbon Dioxide Emissions



Offset Projects

- Methane Destruction
- CO₂ Injection
- Agricultural Practices
- Forestry Practices
- Renewable Energy

Certifiers



Chicago Climate Exchange



World Business Council for Sustainable Development

World Resources Institute



WORLD
ECONOMIC
FORUM

COMMITTED TO
IMPROVING THE STATE
OF THE WORLD



Example

Ecuadorian Rainforest Restoration



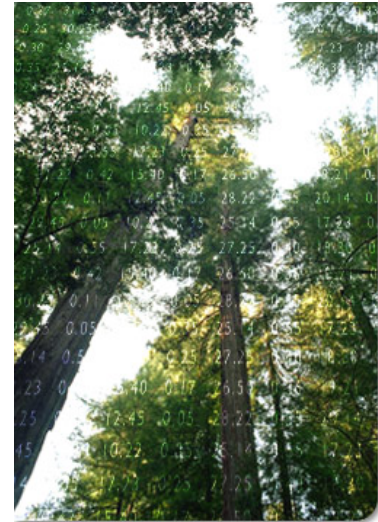
65,500 metric Tons

Comparison to Tags

Carbon Credits

Some Ways the Same

- Includes Renewable Energy
 - Only for systems installed after 1/1/05
 - Only can earn credits from 2005 through 2010
 - No geothermal, landfill gas or direct biomass
 - Conversion based on typical gas-fired CC not EPA eGrid



Many Ways Different

- Does not include Energy Conservation
- Includes methane destruction, agricultural practices, forestry practices, Brazilian fuel switching and “clean development mechanisms”

Renewable Energy Economics

Green Tag Example: Novartis

East Hanover, NJ

- Installs 1 MW solar photovoltaic system
 - Capital Costs = \$8 MM (8,000 \$/kW)
 - Investment Tax Credit = -\$2.4 MM (30%)
 - Depreciation* = MACRS
 - O&M Costs ~ \$0
 - Electricity Savings ~ \$200k /year (15% CF & 15 ¢/kWh)
 - Green Tag Sales ~ \$300k /Year (\$225)
- Payback
 - Without Tags = 18.7 years



With Tags = 7.5 years




Conservation Economics

White Tag™ Example: Pfizer

Groton, CT



- Installs 10 MW Cogeneration system
 - Capital Costs = \$20 MM (\$2,000 /kW)
 - Investment Tax Credit = -\$2 MM (10%)
 - Depreciation* = 150% Declining Balance
 - O&M Costs ~ \$4 MM (8 MBtu/MWh FCP & 5 \$/MBTU)
 - Electricity Savings ~ \$8 MM /year (95% CF & 10 ¢/kWh)
 - White Tag™ Sales ~ \$2.5 MM /Year (\$30)
 - Payback
 - Without Tags = 3.25 years
- 
- With Tags = 2.25 years

White Tag™ Certificates

Compliance states have not included residential for several reasons:

- M&V (accuracy & cost)
- Certification (process & cost)
- Administration (scale and cost)
- Denominations of MWhs (1 MWh minimum to trade)
- Title of the Tags (home owner)
- Use of Rebate Programs (provider gets title)
- Targeted towards existing buildings



White Tag™ Certificates

Guidelines for application to residential market:

- Compliance state
- Quantifiable measures
- M&V method*
- Certification process*
- Aggregation of savings ($> > 100$ MWhs/yr)
- Transfer title of tags from home owner
- No utility rebates
- Common building types/designs



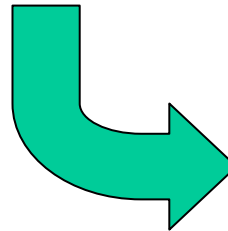
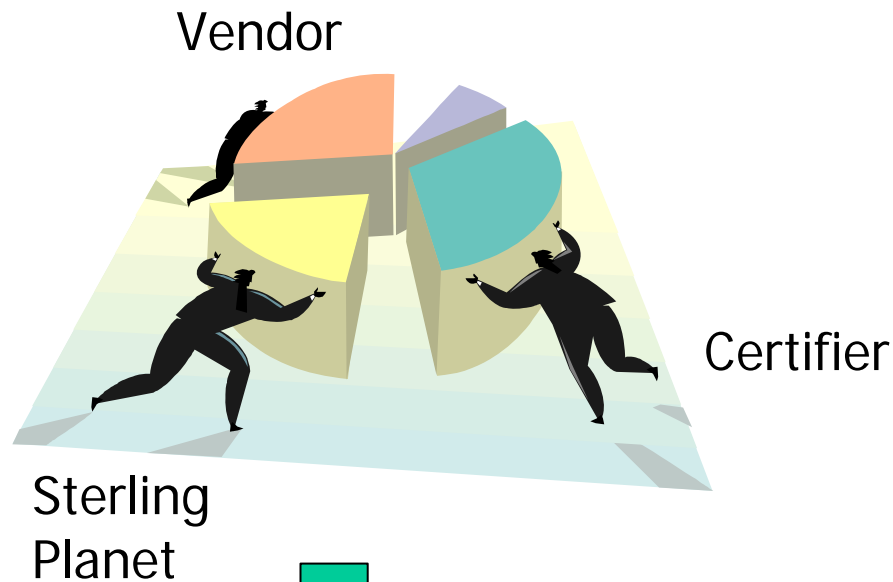
* "Pre-certification" Example

Pre-Certification

White Tag™ Certificates

Pre-certification of some vendor technologies:

- Roofing Shingles
- Transformers
- Fuel Cells



Develop protocols for
Certification including M&V

Questions?

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