

Green Action Team Meeting November 5, 2008

Status of Major Deliverables

**Green Building Initiative
(Exec Order S-20-04)**

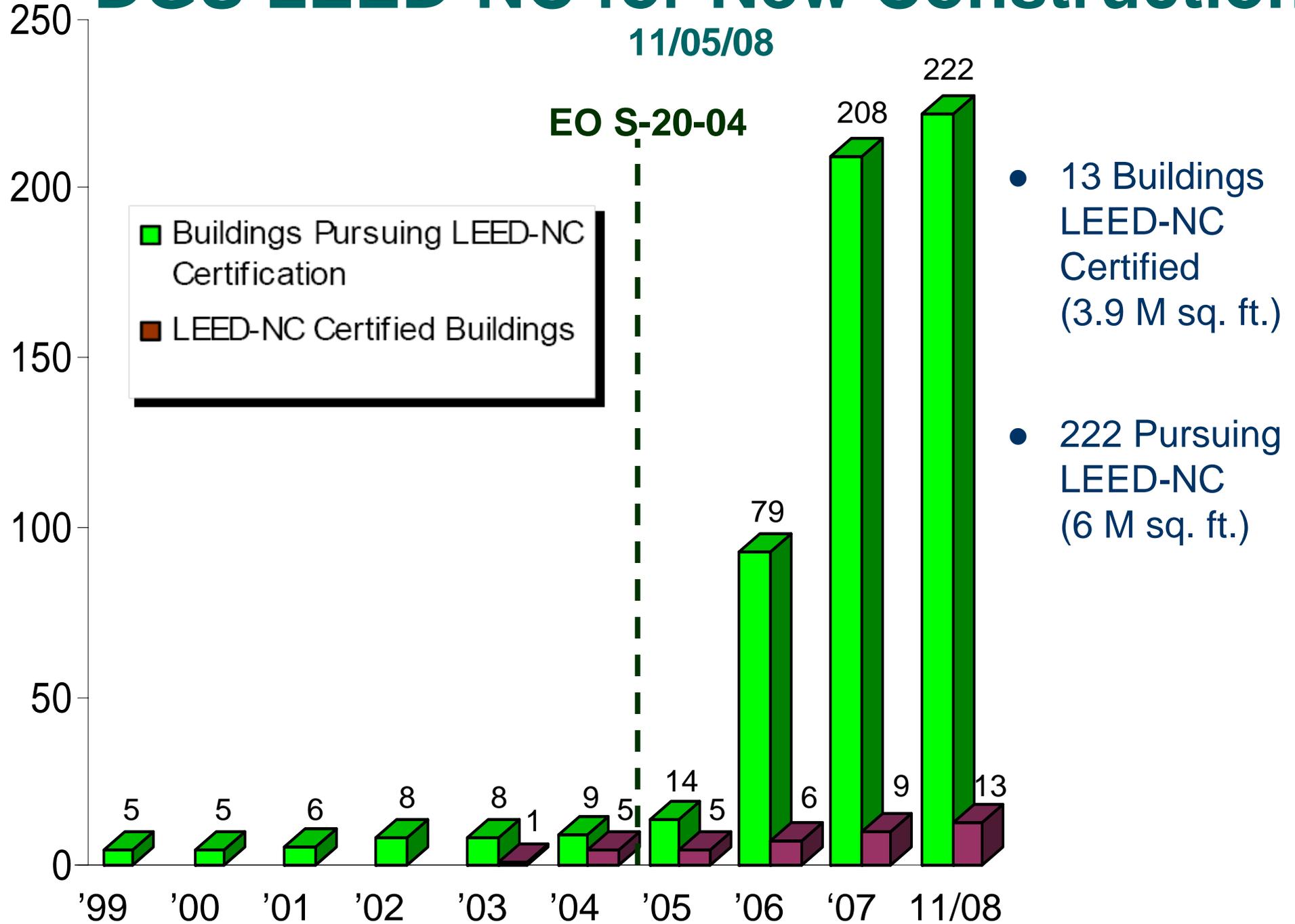


Benchmarking State Buildings

State Benchmarking Status

- **Training for State Benchmarking Leads**
 - September 26th at Ziggurat: In-person, Hands-on
 - 31 State Employees Attended (23 of 33 Departments)
 - Emphasis: Identifying & Resolving Account Problems
 - Advice for Agencies to Reduce Energy
 - Use Portfolio Manager to target facilities
 - Develop plan for reducing consumption
 - Contact DGS and utility reps for help
- **ABS 2.0 Released August 2008**
 - More Efficient Customer-Utility Interface
 - Allows Online Data Release from Customers
 - SMUD, IOUs Implementing; POUs More Challenging
- **Portfolio Manager Overhaul: Mid-2009**

Bldgs. DGS LEED-NC for New Construction



Project Site – California State Los Angeles



LEED-NC - Statewide Program

- **Other Agencies** (CDCR, DWR, DOT) -13.5 M sf/8 years
- **Buildings under 10,000 sf** – LEED Standards
- **In-House Building Commissioning Process** – Under development & study
- **Average Energy Savings** – 25% >Title 24
- **Non-Energy Benefits** – Reduced GHG, Water, Waste, Improved Air Quality
- **LEED-NC Training**
 - Phases I & II: 300 trained (17 agencies) FY 2007-2008
 - Phase III: 75 trained (12 agencies)
 - Next LEED-NC training Spring 2009 for all state agencies

LEED-EB: Operations & Maintenance

(State buildings over 50,000 Sq. Ft. certified by 2015)

- **LEED-EB Certifications:**

- 2 LEED-EB Platinum- CalEPA Building & DGS-operated CA Dept. of Education Building
- 4 LEED-EB Gold- DGS-operated CA Dept. of Public Health/ Heath Care Buildings

- DGS received USGBC approval for pilot volume certification program
- 60 DGS owned and/or operated buildings registered with USGBC January 2008
- RFP for LEED-EB Consultant: Certification/ Recertification/ Training: CTG Energetics

- **LEED-EB Facility Site Assessment**

- 11 Site Assessments Complete
- 48 Assessments Completed by March 2009

- **LEED-EB Schedule**

- 6 Buildings scheduled to submit to USGBC on January 31, 2009 (Began 3 month performance period Oct. 1, 2008). Certification May 2009
- 4 Buildings scheduled to submit to USGBC on April 31, 2009 (Began pre-performance period October 2008). Certification August 2009
- 4 Buildings Four Buildings scheduled to submit to USGBC on July 1, 2009. Certification Nov. 2009
- 6 Buildings scheduled to submit to USGBC on August 31, 2009. Certification December 2009
- 26 Buildings Certified by December 2009

LEED-EB: Operations & Maintenance

- **LEED-EB Training (Open to all State Employees)**

- LEED-EB Overview Training**

- First session December 1, 2008 at 1:00-4:00 PM Ziggurat Auditorium
 - Second session January 2009 in LA/SD Region
 - Third session March 2009- TBD

- LEED-EB AP Training**

- Six week course, 2 hours per session
 - February 2009 – Time & Place TBD
 - September 2009 Time & Place TBD
 - Energy/GHG Tracking, Reporting, Forecasting Database w/ CTG & Natural Logic
 - Revised version of LEED-EB: Operations & Maintenance (O&M) online Fall 2008
 - Green California Web site: online “Existing Building Tool Kit”

Retro-commissioning Program

All state-owned buildings > 50,000 sq.ft. RCx on a 5-year cycle;
Goal - 8% savings

- **Phase I – 25 projects:**

- Continuing to avg. 10% verified electrical savings for measures implemented with avg. payback < 3 yrs.
- Avg. projected electricity savings for measures yet to be implemented approx. 15% with avg. payback approx. 4 yrs.
- Avg. projected Nat Gas savings - 16%

- **Phase II – 18 projects:**

- Investigation phases underway
- CEC/PIER Program – ENFORMA Building Diagnostics installed in 3 buildings in Sacramento; 3 potential candidate buildings in development phase

Continuous commissioning = Persistence of Savings

Continuous commissioning = No re-commissioning required

- **Sustainable funding mechanism needed for front-end investment**

Retrofit Program

Implement cost effective efficiency retrofits – goal: 12% savings

- **State of CA / Investor-Owned Utilities Partnership**
 - Currently planning 2009-2011 cycle
 - Enhanced incentives to improve margins for performance contracting or buy-down costs to fit existing budgets
- **CDCR**
 - 16 projects – \$12.7M (\$8.3M financed; \$4.4M incentives)
 - Energy savings - \$2.3M/yr.; 5.2 yr. payback
 - 12 projects in funding (\$8M financed; \$4M incentives)
 - Projected completion date for all projects by 12/31/08
- **Statewide ESCO Contract**
 - 1st two RFP's combined into one project; contract ready for signature soon
- **Sustainable funding mechanism needed for front-end investment**
 - ESCO model – Fund Investment Grade Audits (IGA's)
 - Non-ESCO model – Leverage funding to support the investigation and design of aggressive energy efficiency projects at large facilities

Small Building Retrofit Model

Buildings < 50,000 s.f. make up 2/3 of State-owned office space

- **Tools Available**

- Rooftop packaged unit tune-up program
- New HVAC technology
- Duct sealing
- LED lighting for work areas and parking lots; PLS (Personal Lighting Systems)
- Load shifting to off-peak usage
- Resource monitoring
 - Track usage
 - Monitor and optimally maintain building systems
 - Calculate GHG emissions

- **Sustainable funding mechanism needed for front-end investment**

- Work in conjunction with Utility On-Bill Financing (OBF)

- **We can reach our goals, but it will take executive support**

Green Leasing - Seek ENERGY STAR leases for buildings over 5,000 s.f. beginning in '06 (new leases) and '08 (existing leases)

- **71 ENERGY STAR leases out of 1,855 total**
 - 2,000+ letters advising preference for ENERGY STAR.
 - 1,160 additional letters/e-mails to commercial market: state's preference for ENERGY STAR, requesting real estate community's support in this effort
 - Coordinating with the States largest Lessors in an effort to get existing lease space certified
- **Existing Leases**
 - 3 retro-commissioning projects complete (Ziggurat, CDCR in Sacramento & Fresno OB)
 - 2 retro-commissioning projects in progress (DOT, Sacramento and CDCR, Sacramento)
- **All build-to-suit leases LEED-NC Silver**
 - 4 projects completed – DMV Clovis, Riverside, Hollywood, Tracy
 - 1 project in construction – CHP Headquarters- Sacramento
 - 6 projects in design – DMV Rancho Cucamonga, Lodi, Stockton, El Monte, Thousand Palms, DIR- San Luis Obispo

CHP Headquarters, Sacramento



On-site Clean Generation - Solar

- **Phase I - 4.2 MW, 8 Facilities**

- CDCR, CalTrans, CSU

- Over 10 million kWh generated to date
- More than 12 million pounds of CO₂ reduction (5,500 metric tons)

- **Phase II – 16 MW, 25 Facilities**

- CSU solar projects awarded

- 16 campuses, 8 MW
- Projects expected to be completed end of summer 2011
- Expected first year generation 12 million kWh

- Evaluating Best and Final Prices for RFP Part I and Part II

- 6 CDCR facilities, 3 DMH, 8 MW
- Projects expected to be completed end of summer 2011
- Expected first year generation 12 million kWh

On-site Clean Generation - Solar

- **Phase III Solar RFP**

- Conducting site visits
- Current estimate for projects 8 MW to 10 MW
- Mix of CSU, CDCR, and DGS facilities
- Issue date for RFP: end of November
- Estimate contract date: May 2009

- **Master Services Agreement**

- Initial meeting with Procurement Division
- Continuing with next steps (business model, process)

- **Solar Thermal Hot Water Projects**

- Offset natural gas usage for domestic hot water needs
- Thermal-driven chiller option

On-site Clean Generation – Fuel Cells

- **Back-Up Power**

- Stanford Mansion -- 20 kW PG&E/SMUD/State Partnership
- Caltrans
- Telecom

- **Co-Generation**

- CDCR
- Veteran's Administration
- CSU Northridge

Other On-site Clean Energy Opportunities to be Evaluated

- **Wind**

- CDCR potential siting opportunities
- Small rooftop turbines (new technology)

- **Geothermal**

- Ground source heat pumps
- Renewable energy source: solar heating of earth
- Potential for doubling HVAC efficiency

- **Biomass**

- Parlin Forks Conservation Camp

Public School Construction High Performance Incentive (HPI) Grant Program

- Proposition 1D provides \$100 million in incentive grants
- Promotes high performance attributes in modernization and new construction public school projects
- DSA reviews plans & verifies point score
 - Uses 2006 Collaborative for High Performance Schools (CHPS)
 - 2009 CHPS criteria to be incorporated into regulations soon
- 57 HPI Grant applications processed, to date
- Approximately \$86 million remains
 - HPI Point Average: 31 points
 - HPI Funding Average: 2.5% increase to the base OPSC grant

Six Components to achieve a grid neutral school:



Comprehensive Planning



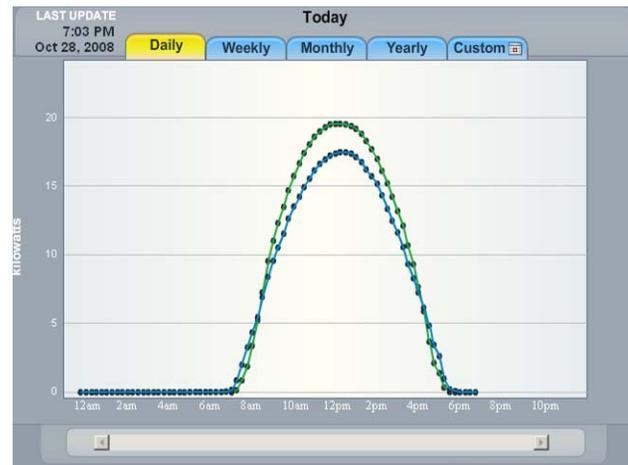
COLLABORATIVE FOR
HIGH PERFORMANCE
SCHOOLS
**Energy Efficient
Design**



Photo courtesy of Green Technology Magazine
Energy Generating Technology



Energy Measurement



Graph courtesy of Fat Spaniel Technologies
Maintenance & Operations



Innovative Funding

Outcomes of the Workshops

Grid Neutral Workshop with Webcast:

- Held on October 20, 2008
- More than 233 attendants including Webcast participants

Workshop Sessions:

- Held October 8 at Community Colleges Green Summit
- November 4-5: Community Colleges Facility Coalition
- February 23-26, 2009: Coalition for Adequate School Housing

Guidebook for K-12 School Districts & Community College Districts Board Members and Superintendents:

- Copies will be available at the Green Schools Summit:
 - December 8-10, Anaheim: two breakout sessions



Environmentally Preferable Purchasing

Chan 498 – PCC 12400 thru 12404

Key Initiatives:

- EPP Task Force and member Work Groups
- Bio-Based Products Purchasing Initiative
- Enhanced EPP Training and Outreach Program
- MOU to expand online Best Practices Manual
- User-Friendly Interactive Web Domain
- Attracting Local Government & Public Schools to Mandatory State Contracts

Successes:

- “CA Gold” Carpet Standard becoming NSF 140 Platinum Standard
- Lamps: Lowest Mercury Levels in U.S.
- Systems Furniture: Low VOC, Energy Efficient, High Recycled Content, Low-Cost
- Disposable Food Service Supplies: Polystyrene-Free and Bio-based
- Paper Products: Process Chlorine-Free, High Post-Consumer Recycled Content
- Cleaning and Janitorial Supplies: Independent 3rd Party Certified
- PC Goods: Mandates Certified EPEAT Silver or Better
- Vehicles: RFP Creates a New Standard in Green Vehicle Purchasing (AB 236)

Green Building Strategy

New Construction and Existing Buildings

- State Buildings
- Public Schools
- Commercial
- Residential

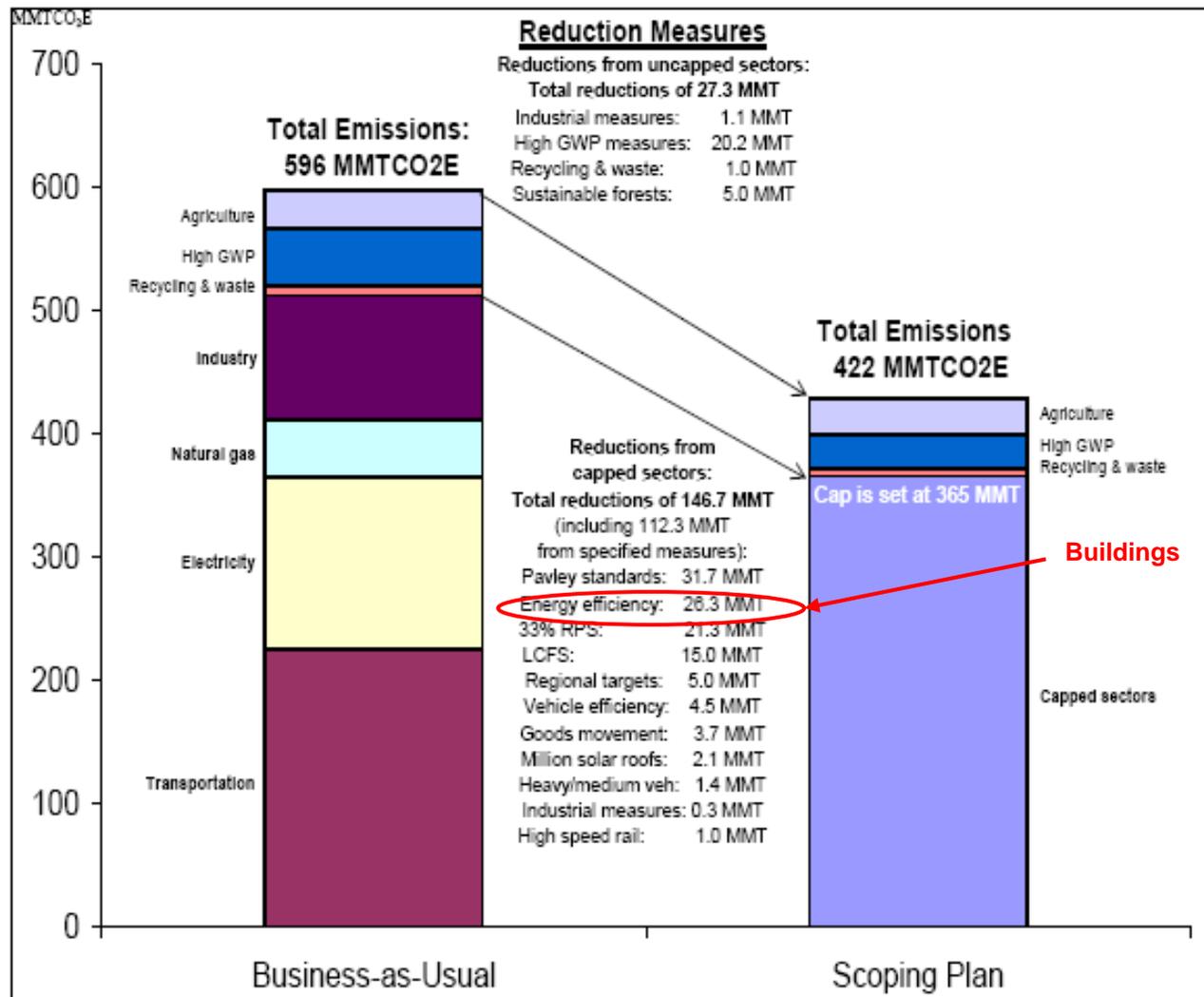


“Existing buildings account for the majority of the potential for GHG reductions.”

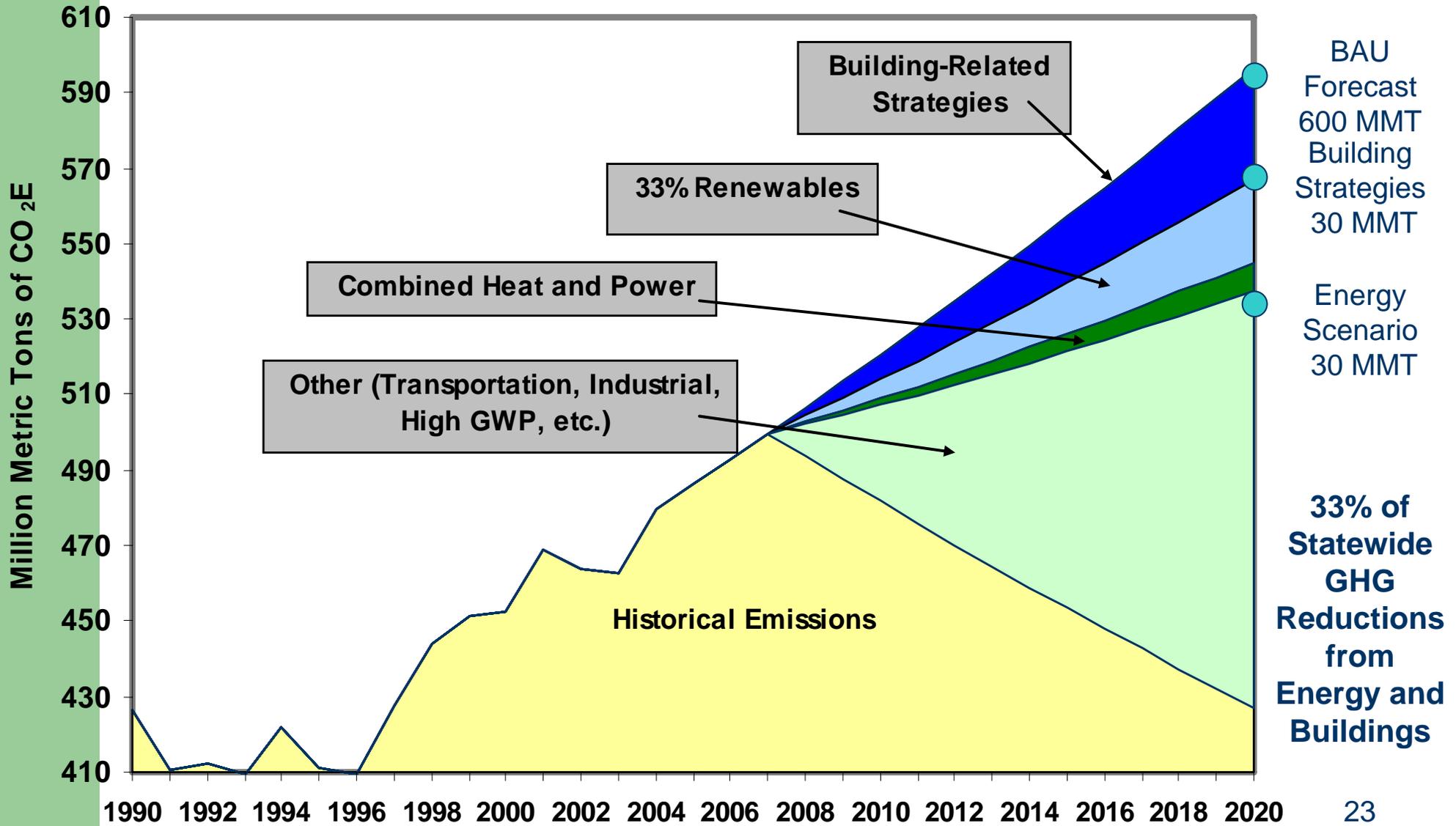
-Draft Scoping Plan Appendices

Magnitude of the GHG Challenge

Figure 3: California Greenhouse Gas Emissions in 2020 and Recommended Reduction Measures



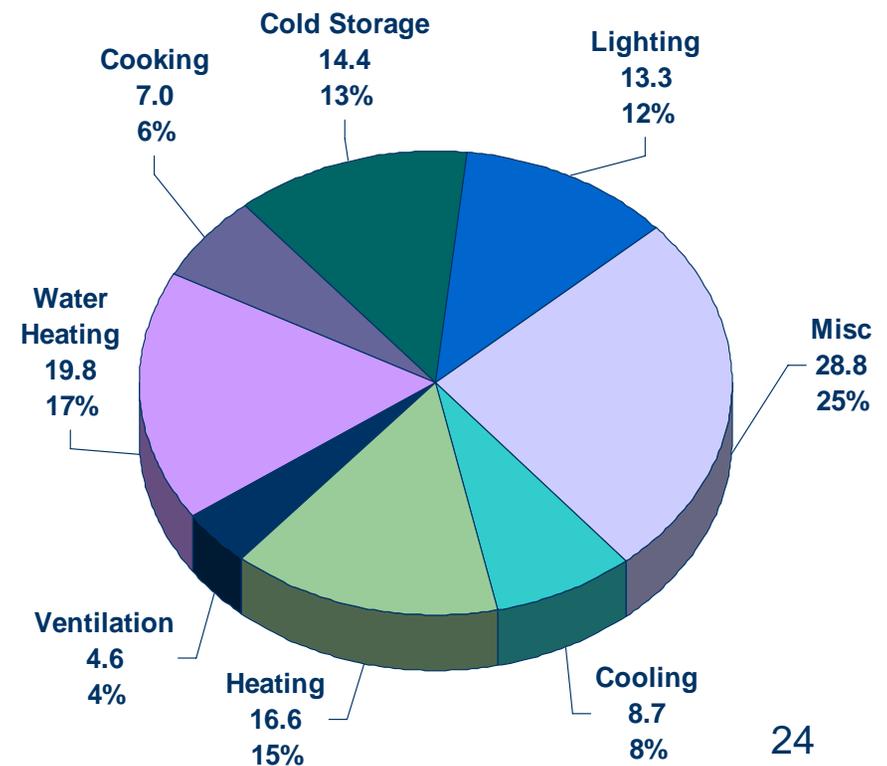
Scoping Plan Strategies to Achieve Maximum GHG Reductions



Note: Projections Based on Preliminary Air Resources Board Analysis

Residential and Commercial Greening Existing Buildings

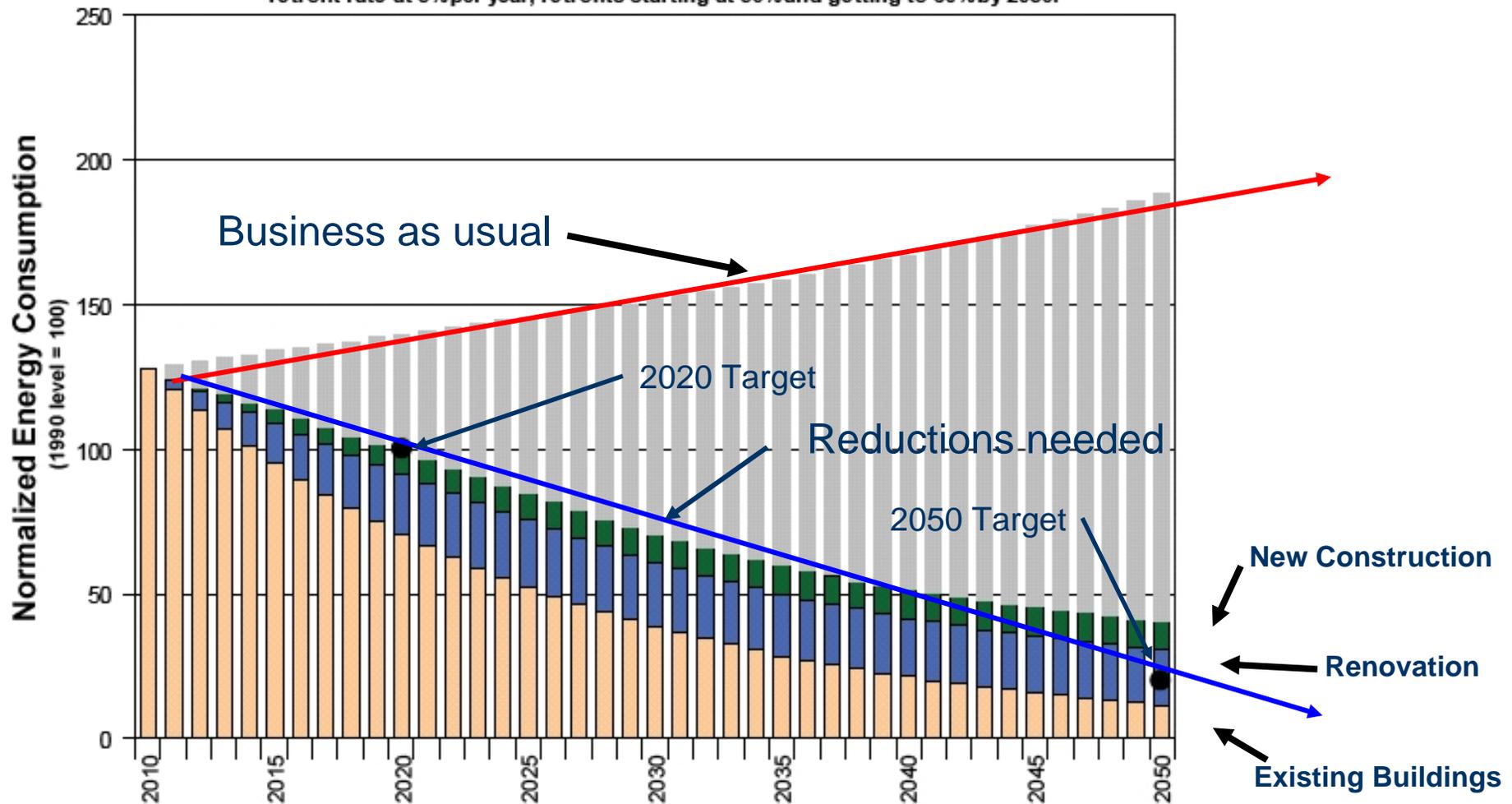
- Over 13 Million Existing Homes in California
- More than 7 Million ft² Commercial Floorspace
- Energy End-Use Demand is driver
- 2004 GHG Emissions
 - 13.6% Residential
 - 7.5% Commercial
- 20 MMT CO₂e Emission Reduction Potential



Achieving AB 32 Targets in Buildings

Aggressive Improvements to Both New and Existing Buildings

New buildings start at 60% energy savings and get to 99% by 2030,
retrofit rate at 5% per year, retrofits starting at 50% and getting to 80% by 2030.



Source: Rick Diamond PhD, LBNL

Residential and Commercial Greening Existing Buildings

- Environmental Performance Testing
 - Benchmark Energy/Water Use
 - Quantify Carbon Footprint
- Voluntary Retrofits
- Third-party Certification
- New Funding Mechanisms
- ZNE Path to 2050



State Buildings

New Construction and Existing Buildings

- 17.5 million ft² planned new construction
- 13,429 existing buildings
- Over 290 million ft² occupied space
- 1 MMT CO₂e Emission Reduction Potential

New Construction & Renovation	2010	LEED-NC 2009 “Gold”
	2025	Zero Net Energy
Leases	2010	LEED-NC 2009 “Silver”
Existing Buildings	2020	LEED-EB 2009 “Silver”

Public Schools

New Construction and Existing Buildings

- Over 5,843 new classrooms needed
- 5.6 million ft² planned new construction
- 9,674 existing schools
- 1.4 MMT CO₂e Emission Reduction Potential

New Construction & Modernization	2010	CHPS California Criteria or LEED for Schools
	2020	Grid Neutral By Design
Existing Schools	2010	CHPS for Existing Schools
	2020	Benchmarking & Efficiency Upgrades

Residential and Commercial Greening New Construction

- California Green Building Standards Code
 - Mandatory Minimum Performance
 - Reference to Title 24 Energy Code
 - Reduce Indoor Water Use by 20%
 - Recycle or Salvage at least 50% Construction Waste
 - Low-emitting Materials to Protect Indoor Air Quality
 - 2.9 MMT CO₂e Emission Reduction Potential
- Beyond Code
 - Local Governments Set Targets Beyond Code
 - Exceed Minimum State Standards
 - Mandates to Achieve Green Building Certification
 - Carbon footprint reduction goal of 35%
 - Zero Net Energy (ZNE)
 - 3.6 MMT CO₂e Emission Reduction Potential

Green Building Strategy

GHG Reduction Potential (26 MMT CO₂e)

Green Building Strategy	New Construction		Existing Buildings	Totals
	Green Building Code	Beyond Code	Retrofits	
State	0.02	0.09	0.9	1.0
Public Schools	0.08	0.1	1.2	1.4
Residential	1.1	0.4	10.4	11.9
Commercial	1.7	3.0	7.5	12.2
Totals	2.9	3.6	20	26*

** To avoid double counting, these GHG reductions are not attributed to green buildings. They are counted under energy efficiency in the Draft Scoping Plan.*

Green Building Strategy

Next Steps

- Schedule GBCAT and Advisory Group Meetings
 - Final Input on Proposed Plan
 - Begin Discussion of Implementation Phase
- Proposed Scoping Plan Board Approval
- ARB Staff to Develop “Toolkit” of Resources
- Work with Key Stakeholders to Implement Goals
- Explore Potential for More Funding Incentives
- Track Progress to Achieve Statewide Targets
 - Zero Net Energy
 - GHG Emission Reductions
- Measure and Verify GHG Emission Reductions

Scoping Plan Approval and Next Steps

- November 20-21, 2008
 - Public Hearing to discuss Plan
- December 11-12, 2008
 - Board vote on Scoping Plan
- January 2009
 - Workshop on program design/localized impacts

Next GAT Meeting

Future meeting announcements & other
important information available at:

www.green.ca.gov