

MUNICIPAL FISCAL BENEFITS OF BUILDING ENERGY EFFICIENCY STANDARDS

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MEETING NAME

DATE





Research Context

- Building energy standards developed by CEC but enforced by local governments
- Research on net benefits to local governments is needed to:
 - Support enforcement of current standards
 - Inform development of future standards
- Future building energy standards will need to be stronger:
 - CEC goals for ZNE residential (2020) commercial (2030)
 - State of CA goal to cut GHGs by 80% by 2050





Research Outputs

1. First-ever estimation of fiscal benefits and costs to local governments of natural gas efficiency standards
2. Identification of barriers to higher energy code compliance rates and recommended measures to overcome them





Key Findings

1. Local government earns back **~\$3.79 per dollar spent** to enforce Title 24, Part 6 standards on natural gas
2. Cities and counties earn back **~\$1.84 per dollar spent** to enforce Title 24, Part 6 standards on natural gas
3. Conservative estimates; not all benefits included
4. Increasing compliance rates will increase benefit streams





Estimating Municipal Fiscal Benefits

- Fiscal benefits to local government come from:
 1. Property tax revenue increases due to energy efficiency measures
 2. Sales tax revenue increases due to redirected energy cost savings and job creation
 3. Reduced health-related costs and productivity losses among local government workforce





Estimating Municipal Fiscal Benefits

- Other municipal fiscal benefits not included due to data gaps:
 1. Indirect job creation in supply chains of items purchased in local economies
 2. Municipal building operational energy savings
 3. Reduction of long-term climate change impacts
 4. Sales tax revenue due to sales of equipment and materials





Estimating Municipal Fiscal Costs

- Incremental costs to local government of energy code plan review and inspection for
 1. Residential and non-residential
 2. New construction and “additions and alterations”





Estimating Municipal Fiscal Impacts

- For each annual cohort of buildings, fiscal costs occur once but most benefits accrue continually for decades (30 years)





Estimating Municipal Fiscal Impacts

- Estimation is for:
 - One annual cohort of new construction and renovation in CA (with accrual of benefits over 30 years)
 - Expected savings from 2013 Update to Title 24, Part 6
 - Natural gas-related impacts only
 - Statewide local government impacts and fictional municipalities



TABLE 1. FISCAL NET BENEFITS TO LOCAL GOVERNMENT FROM BUILDING NATURAL GAS EFFICIENCY STANDARDS

	UNITS	STATEWIDE	LARGE CITY	MEDIUM CITY	SMALL CITY	SOURCES
DEMOGRAPHICS						
Population	people	38,000,000	1,000,000	250,000	20,000	1
Local Government Employment	% work force	8.3	6.5	9.5	10	1
Residential Permits (New Construction)	units/year	136,921	3,000	1,000	75	2
Residential Permits (Additions & Alterations)	permits/year	327,863	8,628	2,157	173	3
Residential Construction Value (New + A&A)	\$/year	34,487,549,855	614,018,058	228,504,515	12,280,361	2, 4
Non-Residential Construction Value (New + A&A)	\$/year	24,413,163,981	580,358,382	280,358,382	210,358,382	2, 4
TITLE 24 PART 6 2013 UPDATE GENERAL BENEFITS (NATURAL GAS ONLY)						
30-Year Energy Cost Savings	\$	199,161,600	5,241,095	1,310,274	104,822	5
30-Year Job Creation	jobs	1,992	52	13	1	6
30-Year Local Externality Savings	\$	3,732,000	1,584,339	396,085	31,687	7
FISCAL BENEFITS TO LOCAL GOVERNMENT						
Residential Property Tax Benefit	\$	38,798,494	690,770	257,068	13,815	8
Non-Residential Property Tax Benefit	\$	186,760,704	4,439,742	966,498	69,670	9
Sales Tax Benefit	\$	1,792,454	47,170	11,792	943	10
Job Creation Benefit	\$	448,114	11,792	2,948	236	
Avoided Local Externalities Benefit	\$	154,878	19,309	7,055	594	
Total	\$	227,954,644	5,192,666	1,239,472	84,763	
FISCAL COSTS TO LOCAL GOVERNMENT						
Energy Code Enforcement Costs	\$	60,170,500	1,462,797	415,699	32,256	11
NET FISCAL BENEFITS TO LOCAL GOVERNMENTS						
Net Fiscal Benefit to All Local Government	\$	167,784,144	3,729,869	823,773	52,507	
Net Fiscal Benefit to Cities & Counties	\$	50,493,361	1,062,003	187,519	9,094	
Fiscal Benefit-Cost Ratio to All Local Government	ratio	3.79	3.55	2.98	2.63	
Fiscal Benefit-Cost Ratio to Cities & Counties	ratio	1.84	1.73	1.45	1.28	

SOURCES FOR FISCAL NET BENEFITS TO LOCAL GOVERNMENT FROM BUILDING NATURAL GAS EFFICIENCY STANDARDS (FOR EACH YEAR'S COHORT OF BUILDINGS)

1 = U.S. CENSUS AND AMERICAN COMMUNITY SURVEY VIA CITY-DATA.COM

2 = RAND CALIFORNIA BUSINESS AND ECONOMIC STATISTICS, NEW CONSTRUCTION PERMITS IN CALIFORNIA CITIES AND COUNTIES

3 = BUILDFAQ (2014)

4 = CIRB (2013)

5 = CEC (2013); AND [HTTP://ENERGYALMANAC.CA.GOV/NATURALGAS/HISTORICAL_RESIDENTIAL_YEARLY_PRICES.HTML](http://ENERGYALMANAC.CA.GOV/NATURALGAS/HISTORICAL_RESIDENTIAL_YEARLY_PRICES.HTML)

6 = BURR ET AL (2012)

7 = NATIONAL ACADEMY OF SCIENCES (2010)

8 = KOK AND KAHN (2012)

9 = EICHHOLTZ ET AL (2010)

10 = STATE BOARD OF EQUALIZATION (2010) AND COLEMAN (2006)

11 = WILLIAMS ET AL (2013)



Property Tax Revenue

- Commercial property sale prices up 1% for each 10% increment of energy savings (Eicholtz et al 2010)
- Residential property sale prices up 2-4% due to green rating (Kahn and Kok 2013); only 0.25% of this assumed to be from energy efficiency
- ~\$35b/yr in residential construction; ~\$24b/yr in commercial
- Property tax rates ~1.5%; virtually all revenue to local govt.



Clif Bar Headquarters. Image Courtesy of ZGF Architects, LLP





Sales Tax Revenue

(Redirected energy savings)

- 7.04 million therms expected to be saved by 2013 Update of Title 24, Part 6 (CEC 2013)
- Typical recent retail price: \$9.43 per thousand cubic feet
- ~30% of savings redirected to locally taxable spending (State Board of Equalization 2010)
- ~\$0.03 per dollar spent is sales tax yield to local government



Fort Bragg Development. Image Courtesy Danco Communities





Sales Tax Revenue

(Local job creation)

- Efficiency creates ~10 jobs per \$1m of energy cost savings (Burr et al 2012)
- Assumes half of jobs created in CA; average wage of \$25/hr
- ~30% of new income created is spent on items subject to local sales tax (State Board of Equalization 2010)
- Job creation benefits for one year only, not 30 years





Avoided Health and Productivity Costs

- Externalities, including health and labor productivity impacts, estimated by National Academy of Sciences (2010)
- Only non-GHG impacts associated with in-home natural gas used for estimate (local air basin impacts)
- ~8.3% of California workers employed by local government
- Assumed half of cost impact to employer, half to worker





Fiscal Costs of Standards

- Incremental costs to local government using traditional methods:
 - Residential: \$30-100 per unit
 - Commercial: ~\$180-800 per common commercial building; \$1000s for complex commercial building
- Assumed upper end of range: \$100 per residence and \$1000 per commercial building





Barriers to Higher Compliance

- Frequently changing requirements
- Low prioritization and lack of resources
- Perceived disconnect between compliance and economic/
fiscal benefits





Incentives for Higher Compliance

- Employing a comprehensive approach
- Better training
- Standardizing documentation
- Licensing of energy consultants
- Selling compliance





Recommendations (for Building Departments)

- Identify an energy code “champion”
- Work with Regional Energy Networks (RENs) and/or utilities to enhance staff training
- Identify ways to streamline paperwork and improve inter-departmental coordination





Recommendations (for Building Departments)

- Ensure that any fee increases create visible improvements in review and inspection processes
- Initiate conversations with utilities about financing energy code review and inspection
- Make case to elected officials that added enforcement brings benefits to local government budgets





Questions?

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