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Transforming Water: Water Efficiency as Stimulus and Long Term Investment

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Outline

- Policy Context – Analysis of Stimulus Options
- Short- and Long-term Economic Impacts of Water Efficiency
 - Stimulus prospects
 - Short-term viability
 - Long-term viability
- Conclusion



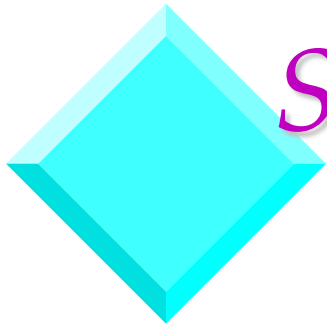
Transforming Water - Context

- The Alliance for Water Efficiency advised Obama's transition team about the employment potential and economic benefits of broad investments in water efficiency.
- Water Efficiency Programs = Water infrastructure reconfiguration-related investments.
 - Ex: Investment in improved outdoor water use efficiency (i.e.: smart irrigation controllers)



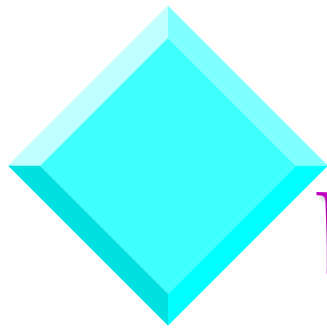
Question

- What do investments in water efficiency look like as a stimulus?
 - Jobs created,
 - water savings and
 - other economic benefits
- Can Water Efficiency be a cost-effective investment to consider for the stimulus package?



Short-term Impacts of Water Efficiency Investments on:

- Job Creation
- Income
- GDP
- National Output
- Water Savings
- And other benefits



Qualitative Benefits of Water Efficiency Programs

- Public involvement in the program
- Empower water customers to control their water bills
- Forestall the need for energy-intensive new water supply development
- Reduced energy results in reduced greenhouse gases and an increase in national energy independence
- And more.



Methodology

- Model: Input-Output (I-O) model of U.S. economy
- Use: Evaluate near-term economic benefits of large-scale investments in water and energy efficiency programs
- Measured: Effects on job creation, labor income, contribution to gross domestic product (GDP), and national output.



Sample Water/Energy Efficiency Program Investments that were Evaluated

- Rebate and direct install programs
- Outdoor water use programs
- Commercial/Industrial cooling tower water/energy retrofits
- Industrial process water improvements
- Municipal water utility leak detection and system water loss reduction programs.



Program Expenditure Categories

1. Expenditures for repair, maintenance, and new construction
2. Expenditures for new physical assets
3. Expenditures for surveys, installation, and other services
4. Expenditures for program administration



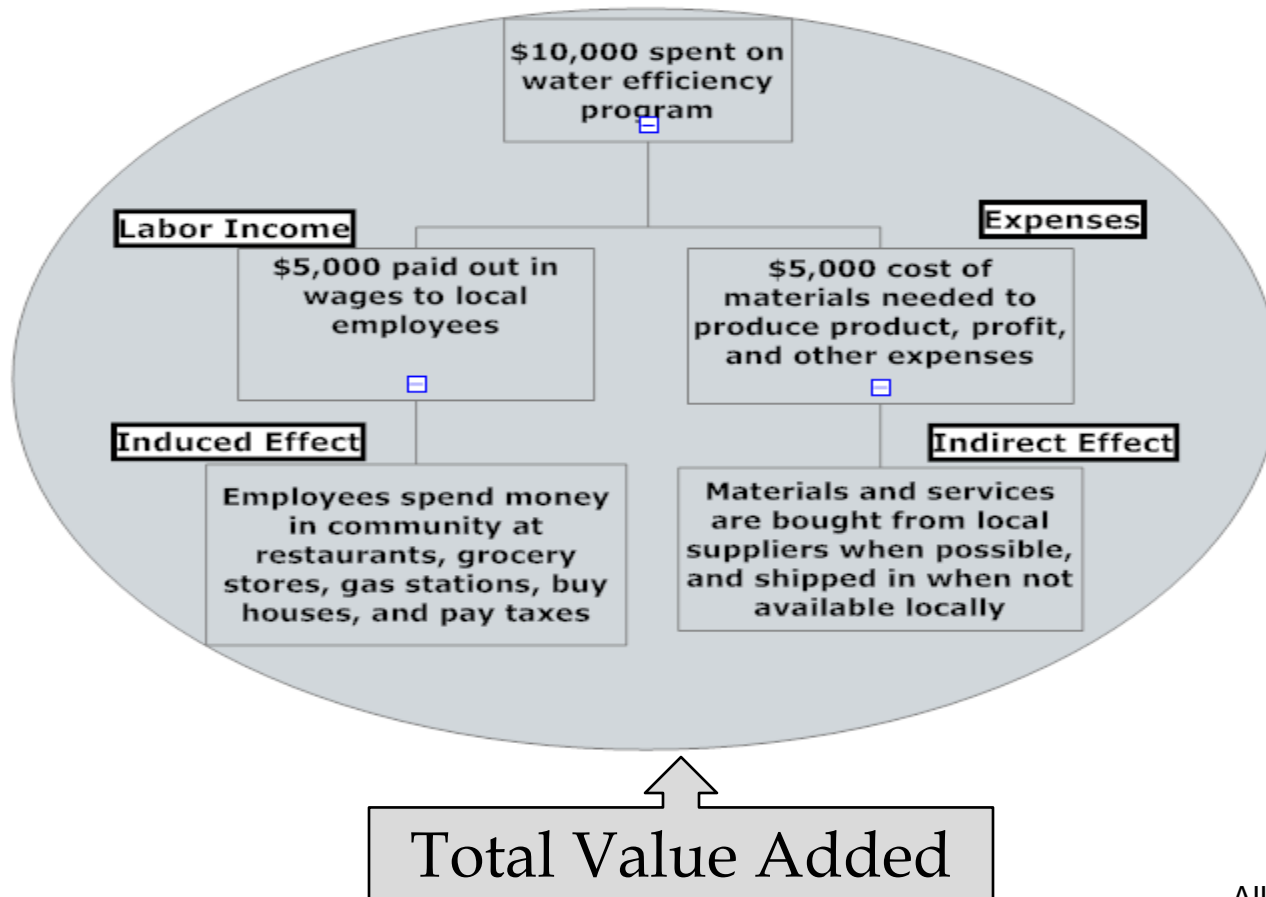
Modeling Methods

- Expenditures are mapped to the appropriate economic sectors in the IMPLAN I-O model
- Unique mappings were performed for each water/energy efficiency programs
- Total impacts estimated with the model consist of direct and indirect impacts of program expenditures



Modeling Economic Impact

Regional Economic Impact - Water Efficiency Program Example





Results

- Direct investment in efficiency programs has the potential to have significant and positive stimulus impacts
- Direct investment of \$10 billion in efficiency programs can boost:
 - U.S. GDP by \$13-15 billion and
 - U.S. Employment by 150,000 to 220,000 jobs.



Economic Stimulus Benefits, Per Million Dollars of Investment

Total Impact Per Million Dollars of Direct Investment
(million \$, except employment)*

Program Option	Output	GDP	Labor	
			Income	Employment
Water System Loss Control	\$2.82	\$1.44	\$1.05	21.6
ET Irrigation Controller Rebate/Direct Install Programs	\$2.55	\$1.31	\$0.85	20.4
HE Toilet Rebate Program	\$2.54	\$1.47	\$0.96	18.0
HE Toilet Direct Install Program	\$2.46	\$1.38	\$0.87	17.2
Industrial Water/Energy Survey & Retrofit Program	\$2.78	\$1.31	\$0.89	15.6
Retrofit Cooling Towers with Conductivity and Ph Controllers	\$2.47	\$1.29	\$0.78	15.4
Restaurant Surveys & Direct Install Equipment Retrofits	\$2.79	\$1.26	\$0.82	14.6

*Impacts calculated using IMPLAN Pro Version 2.0.1021 and 2007 national economy data file.



Distribution of Benefits of Direct Investment in Efficiency Programs

Economic Sector (2-digit NAICS)	GDP (Million \$)	Employment (Jobs)
Ag, Forestry, Fish & Hunting	\$89	1,706
Mining	\$181	591
Utilities	\$232	438
Construction	\$1,112	16,917
Manufacturing	\$2,313	24,315
Wholesale Trade	\$1,016	8,353
Retail Trade	\$1,398	24,768
Transportation & Warehousing	\$357	5,235
Information	\$431	2,459
Finance & Insurance	\$753	5,594
Real Estate & Rental	\$1,054	5,500
Professional- Scientific & Tech Svcs	\$818	9,123
Management of Companies	\$305	2,242
Administrative & Waste Services	\$682	18,191
Educational Svcs	\$57	1,651
Health & Social Services	\$437	8,328
Arts- Entertainment & Recreation	\$78	2,059
Accommodation & Food Services	\$220	7,077
Other Services	\$1,113	17,548
Government & Non NAICs	\$857	13,409
Total	\$13,501	175,504



Water Savings

- Cost estimates of water efficiency programs yield water savings at unit costs ranging between \$170 - \$1,600 per Million Gallons.
- Average water savings
 - ~ \$575 / Million Gallons.



Water Savings Scenario

- \$10 billion water efficiency investment:
 - For range of water efficiency programs costing on average \$1,000/Million gallons:
 - 10 trillion gallons of water total
 - 2.7 billion gallons per day
- This volume could service 5 percent of US population for 10 years



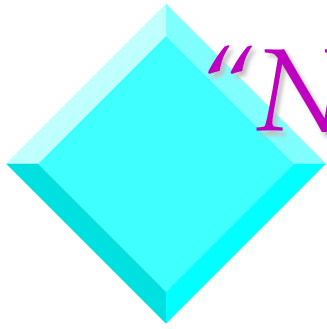
Rapid Deployment Potential

- Water efficiency programs can be:
 - Rapidly deployed
 - Scaled to need
- Water efficiency investments can provide immediate, short-term stimulus impacts – a key benefit given the current economic crisis.



Aid for Distressed Communities

- Opportunities for conservation investment in lower-income areas
 - Ex: Los Angeles pioneered the use of community-based-organization (CBO) deployment models for ultra-low flush toilet installation in early 1990s.



“No Regret” Investments in the Nation’s Future

- Long-term strategic, economic, social, and environmental benefits of efficiency programs make them “no-regret” investments in the nation’s future.
- Benefits include: advancing national energy policy, promoting sustainable resource use, contribution towards GHG emissions, reduction, and resolving regional conflicts over water resources.



Diffusing Regional Water Conflicts

- Pressures on overstretched water resources are spawning regional conflicts over water resources.
- Demand for freshwater is outpacing available supplies.
- Water use efficiency investments will be key component of policies intended to resolve these conflicts.



Contribution to National Energy Policy

- Saving energy is one of the most compelling reasons to save water.
- Good for the economy (as shown) and good for the environment.
- Water and energy efficiency also reduce negative externalities.
- Further savings in avoided energy costs.



Some Energy Consumption Facts

- California Energy Commission:
 - 19% of state's electric energy load is related to drinking- and wastewater processes.
 - 32% of state's natural gas load is related to heating of customer end use hot water.
 - 95% of CA energy efficiency goals could be met with water efficiency programs at 58% of the cost.



Energy Consumption Facts

- California State Water Project is largest single user of energy in California.
- A lower bound of 4% of national electricity use goes towards moving and treating drinking- and wastewater
- ~80% of municipal water processing and distribution costs are for electricity



Conclusion

- Water processes are energy and cost-intensive.
- Water efficiency programs have the potential:
 - to reduce water and energy related costs,
 - while providing economic stimulus benefits:
 - Job creation,
 - GDP growth, and
 - Total net economic output.



For More Information:

- California Energy Commission - Integrated Policy Report:
 - www.energy.ca.gov/2005publications/CEC-100-2005-007/CEC-100-2005-007-CMF.PDF
- Center for Sustainable Systems - U.S. Water Supply and Distribution Factsheet:
 - http://css.snre.umich.edu/css_doc/CSS05-17.pdf
- U.S. Department of Energy – Energy Demands on Water Resources Report to Congress on the Interdependency of Energy and Water:
 - <http://www.sandia.gov/energy-water/docs/121-RptToCongress-EWwEIAcomments-FINAL.pdf>