

Reality Check: The Nature and Performance of Voluntary Environmental Programs in the U.S., Europe, and Japan

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**Presentation at
2007 CTCI Foundation Environmental and Energy Convention**

Taipei, Taiwan

January 2007

Presentation based on

*Reality Check: The Nature and
Performance of Voluntary
Environmental Programs in the U.S.,
Europe, and Japan*

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William Pizer, editors**

**Resources for the Future Press,
February 2007**

Key Issues

- Do voluntary programs deliver significant environmental gains relative to a realistic baseline, i.e., do they change behavior?
- If so, how large are the gains?
- Do results differ for toxics vs energy programs?
- What else affects program impact?

Background

- 87 EPA programs = 1.6% operating budget (2005)
- Dozens more in states, other federal agencies
- 300 + VPs reported by European Environmental Agency (1997)
- 30,000 + VPs/VAs in Japan (Tsutumi, 1999)
- Types of programs
 - Unilateral agreements
 - Public voluntary programs
 - Negotiated agreements

Motivation for Business

- Get ‘hands on’ experience
- Enhance reputation with customers, gov’t, investors, communities, etc.
- Benefit from government-provided TA
- Help shape future requirements

Motivation for Government

- Get ‘hands on’ experience in the absence of regulatory mandate
- Experiment with more holistic approaches vs traditional regulation
- May help build public support for future action
- May help build bridges to industry, e.g., via technical assistance

Environmental View

- Overall, mixed reaction
- Some applaud VP's as means to build support in public, industry
- Some fear regulatory capture, distraction from real work of environmental protection, shift in focus from worst polluters to more progressive firms

Our Approach

- Seven case studies of VP's in US, Europe, Japan
- Method: In depth analyses focus on context, design, quantitative performance of programs relative to realistic baseline
- Coverage
 - Energy (6), toxics (1)
 - Focus on programs where results are measurable

Table 1-1: Selected Characteristics of Case Studies

Program	Author(s)	Years of Operation	Energy, CO₂ (GHGs), or Toxics	Industry or Household	Program Type
33/50 (US)	Khanna	1991-1996	Toxics	Industry	Public Voluntary Program
Japanese Keidanren	Wakabayashi and Sugiyama	1997-	CO₂	Industry	Negotiated agreement
UK Climate Change Agreements	Glachant and Muizon	2001-	CO₂	Industry	Public Voluntary Program
Danish Energy Efficiency Agreements	Krarup and Millock	1996-	CO₂	Industry	Negotiated agreement
German Cement Industry	Bohringer and Frondel	1995	CO₂	Industry	Unilateral agreement
Climate Wise (US)	Morgenstern, Pizer and Shih	1993-2000	GHGs	Industry	Public Voluntary Program
California Demand Side Management	Sanstad	Early-mid 1990s	Energy	Household	Public Voluntary Program

33/50 Program

- Followed development of TRI
- Focus on measurable reductions (33%, 50%) for 17 TRI chemicals in major industries (1991)
- Actual reductions clearly exceeded goals
- Sophisticated studies find program reduced emissions, controlling for self-selection, especially for larger firms
- Partly attributable to fear of regulations
- Some evidence suggests no/negative gains beyond Montreal Protocol substances

Keidanren Voluntary Action Plan

- Involves large firms representing 80% of industrial, electric emissions (almost half of Japan's total emissions) (1997)
- Targets negotiated for sectors, not firms
- So far, emissions below target levels
- Reductions attributed to industry, gov't cooperation, fear of regulation, firms' social awareness
- Questions about BAU estimates, stringency of goals
- Is program really voluntary?

UK Climate Change Agreements

- CCAs part of tax (\$9-18/ton of CO₂), and emissions trading policies (2001)
- Intensity or fixed targets negotiated with gov't
- Covering 12,000 sites = 44% UK emissions
- 80% rebates of levy for meeting CCA goals
- Goals exceeded (based on observed permit prices), although stringency in question
- Overall, authors find that CCAs make small contribution

Denmark's Energy Efficiency Agreements

- VAs part of policy package involving CO₂ taxes (\$18/ton) on industry (1996)
- Negotiated agreements based on audits, adoption of energy efficiency measures. No quantitative targets
- 100% tax rebates for participants
- Audit eventually dropped
- Using data from 60 firms, authors find some reductions in early years, although quite modest reductions overall

German Cement Industry

- Unilateral commitment by major sectors (not firms) for 20% cuts below 1987 levels by 2005; case focuses on cement industry (1995)
- By 2000 most goals met; target raised to 28% reduction
- Trend regression used to establish baseline using historical data
- Actual emissions same as forecast BAU (+/- 5%)
- Authors recommend firm specific targets; negotiated instead of unilaterally set

Climate Wise

- EPA program involving negotiated agreements with 600+ firms (1993)
- Emissions based program; TA, other incentives offered for joining
- Comparisons with matched set of non-participants used to determine what would have happened anyway
- Authors find modest differences in fuel (-) and electricity (+) use in early years; no significant differences later on

Residential DSM in California

- Utilities started providing free technical information to single family houses in 1970s
- Two of three evaluations indicate savings ‘that would not have occurred without programs’
- One study finds changed maintenance and other practices more important than use of new equipment
- Some evidence that provision of information by authoritative source is key

Table 9-1: Quantitative comparison of the effect of voluntary programs on behavior

	Quantity measured	Estimated Effect	Scope	Baseline	Comment
33/50 Program	Aggregate toxic releases	28%	Participating chemicals facilities	Non-participants with self-selection model	Effect reversed when ODS excluded.
UK Climate Agreements	GHG emissions	9%	Participating industries	Negotiated forecast	Baseline criticized; considerable over-achievement.
Danish Energy Efficiency Agreements	Energy Use	4-8%	Participating facilities	Non-participants	Estimate based on 60 participants.
German Cement Industry GWP Declaration	Energy per unit of cement	0	German cement industry	Econometric forecast using historic performance	Baseline error band is +/- 5%. 2005 target achieved by 2000.
Japanese Keidanren	CO ₂ emissions	5%	Participating industries	Keidanren forecast of 2010 BAU	Basis of BAU estimate unclear.
Climate Wise	Fossil energy expenditures	3%	Participating facilities	Matched non-participants	Electricity expenditures estimated to rise 6%. Margin of error is +/- 5% and both effects vanish after 1-2 years.
California Demand Side Management	Natural gas & electricity demand	2-4%	Participating households	Non-participants	Covers three programs; some evaluations more carefully matched non-participants / controlled for self-selection

Cross-Study Observations

- Estimates of emission reductions range from zero (German cement) to 28% (33/50)
- Energy programs reduce emissions by less than 10%, more typically 5%
- How can we understand these findings?

Media and Activity

- Energy vs toxics
- Key differences
 - Local/regional vs global pollutant
 - Direct/acute vs long-term effects
 - Pre-existing energy prices vs un-priced industrial byproduct, i.e., always had incentive to consider energy efficiency; none necessarily to look at toxics

Incentives for Participation

- Range of incentives
 - Free information
 - PR opportunity
 - Threat of regulation
 - Pressure from trade association
 - Relief from taxes
- Range of outcomes
 - Climate Wise (small incentives, low participation) vs UK and Keidanren (big incentives, high participation)
 - Danish (high cost, low participation,) vs German (low cost, high participation)

Methods for Establishing Baseline Used by Authors to Assess Programs

- Forecast vs control group
- Forecast can be established by business and gov't (UK, Keidanren) or quantitatively estimated (German cement)
- Forecast method more common but easily outdated by change in energy prices, etc. (e.g., Bush Climate Plan)
- Control group difficult to identify, fraught with issues

Conclusions (1)

- Hard to reject conclusion of 5% reduction for energy programs, +/- 5%. Thus, evidence that VPs do change behavior, but not suitable for major reductions
- Significant differences exist between energy and toxics, although clear limitation on toxics as well
- Incentives have only modest impact on reductions achieved, but do affect participation

Conclusions (2)

- Efforts to increase program breadth (i.e., many participants) may yield greater environmental gain than efforts to increase depth (big cuts in emissions for individual firms) (broad vs deep)
- More attention needed on baselines for evaluation, including both forecasts and control group approaches
- Subtle changes in social attitudes and corporate practices may be significant but are difficult to measure