2009 – 2020 California Statewide Energy Efficiency Strategic Plan

1. Recommendations for Industry

1.1. Introduction, Stakeholder Input Process, and Vision

The most recent estimate of California industry annual electricity end use is 50,800 GWh, including mining, data centers, and water/wastewater facilities.[1] Industrial natural gas use is estimated at 730,000 million cubic feet annually. [2] A peak industrial demand of approximately 4700 MW is estimated for industrial facilities served by the California investor owned utilities (IOUs). [3] Industry represents approximately 18% of the total annual electricity use in the state, 23% of the natural gas use[4], 22% of the total energy use[5], and more than 20% of end use CO_2 emissions.[6]

The latest estimate of energy savings potential is based on 2002-03 data for industrial facilities served by the IOUs and projects a maximum achievable energy savings potential for electricity in the period from 2005-2016 of approximately 2750 GWh or 8% of use and a demand savings of approximately 375 MW. For natural gas, the maximum achievable energy savings potential for the same period is 192 Mth (approx 1920 million cubic feet) or 5% of use.[7] [8]

Recent estimates also suggest that roughly 3% of California's annual electricity use and 14% of its annual non-power plant natural gas use can be attributed to the treatment, distribution, and use of water by the California industrial sector. [9] Based on California's latest greenhouse gas (GHG) emissions inventory, this energy use generates around 10% of California's annual non-transportation related GHG emissions arising from fossil fuel combustion. [10]

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[1] *2007 Integrated Energy Policy Report,* California Energy Commission, CEC-100-2007-008-CMF. Other estimates include 33,000 GWh for the California IOUs from KEMA, LBNL, and Quantum Consulting. 2006. *California Industrial Existing Construction Energy Efficiency Potential Study*, final report to Pacific Gas & Electric, CALMAC Study PGE0252.01 [excluding data centers, water/wastewater facilities, mining, and oil extraction] and 51,000 GWh from the Energy Information Agency 2006. *California Table 8. Retail Sales, Revenue, and Average Retail Price by Sector, 1990 Through 2006* [Note: at time of this report the 2007 CA IOU Electric Energy Efficiency Update Study was incomplete for industry]

[2] Energy Information Agency 2006. Natural Gas Consumption by End Use for California 2001-2006.

[3] 2005 industrial participation in reliability and day ahead demand response programs were 1857 and 1044 MW respectively. Quantum Consulting. 2006. *Evaluation of 2005 Statewide Large Nonresidential Day-Ahead and Reliability Demand Response Programs: Final Report*.

[4] Lawrence Berkeley National Laboratory, unpublished research on CA Energy Balances 2007

[5] *2007 Integrated Energy Policy Report*, California Energy Commission, CEC-100-2007-008-CMF

[6] California Air Resources Board, Greenhouse Gas Emissions Inventory, November 2007 Sacramento. It is important to note that industry is also responsible for a share of CO_2 from the electric power sector, not included in this value.

[7] KEMA, LBNL, and Quantum Consulting 2006. *California Industrial Existing Construction Energy Efficiency Potential Study*

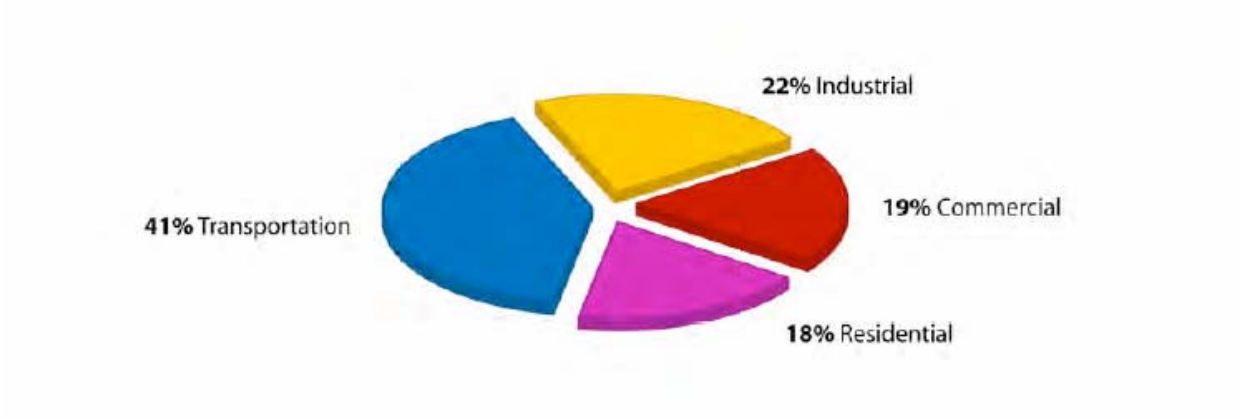
[8] Although municipal water/wastewater facilities and data centers are included in the industrial sector for the purpose of this strategic planning process, they are excluded from the estimated energy savings cited in this report. Energy savings or GHG reduction potentials from other fuels such as coal or industrial wastes (significant for some sectors) are also not included.

[9] California Energy Commission (2005). Integrated Energy Policy Report: Chapter Eight: Integrating Water and Energy Strategies. Sacramento, California. CEC-100-2005-007CMF

[10] California Energy Commission (2006). Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004. Sacramento, California. CEC-600-2006-013-SF. December; and California Energy Commission (2007). Revisions to the 1990 to 2004 Greenhouse Gas Emissions Inventory Report. Sacramento, California.

Industrial energy efficiency has an important contribution to make to the overall security, economic, and environmental health of California. The purpose of this document is to neither support nor refute estimates of use or savings potential, but rather to provide a series of recommendations for industrial energy efficiency that 1) identifies a path toward achieving significant energy efficiency improvement and corresponding reductions in GHG emissions and 2) provides a context for maintaining, and perhaps improving, the competitiveness of California's industries in the process.

Energy Use By Sector 2006



Source: California Energy Commission 2006, as published in 2007 Integrated Energy Policy Report

Three market realities distinguish the role of industry from the commercial and residential sectors in contributing to the energy efficiency and greenhouse gas (GHG) reduction goals for California. First, industry uses a large quantity of energy and other resources via complex processes to create and bring to market products that meet societal needs. Products, to varying degrees, all have embedded energy that cannot be simply "zeroed out" without comprehensive long-term planning, including the use of off-sets, to avoid unintended consequences. Second, industrial facilities in California are increasingly managed by corporations that reside outside of the state or outside of the country and who view these facilities as mobile assets in their efforts to compete in the global marketplace. If California's industries are to maintain value within their own corporate structures, regulatory uncertainty and its associated risks must be effectively addressed. Third, California industry is highly diverse in type, size, and operation. One size policy does not fit all.

At its most fundamental, effective public policies in California to promote industrial energy efficiency and reduce GHG emissions need to be designed to recognize and work with, rather than against, these realities. Responsible stewardship as a global leader in progressive approaches to climate change requires no less. While even failed public policy may result in meeting energy efficiency and GHG reduction targets, it will be at a substantial societal and economic cost as corporations transfer their industrial operations to more business-friendly (and potentially less environmentally responsible) locations. To paraphrase a workshop participant from a tomato processing facility, just because California has the best environmental conditions to grow tomatoes doesn't mean another country can't squeeze it out of the market. Recent losses include industries closely identified with the state, such as semiconductor chip manufacturing. Unless the future of California is destined to be "industry-free", a meaningful

dialogue is needed at the highest levels of government to craft an interagency policy that supports both environmental responsibility *and* business growth over the long term.

The goal is to develop supporting policies for continuous improvement in California industry for resource utilization, encompassing all aspects of energy utilization, GHG emission reduction, water conservation, waste disposal, and air quality. The intent of these recommendations is to build on the successful efforts of the investor owned utilities (IOUs) and others to serve the industry market and to apply the experience of these programs to broaden, enhance, and better target these services

Opportunity: California could lead the way in positioning energy efficiency to the financial community as a key enabler and risk mitigation strategy in addressing industrial GHG emission reduction, waste disposal, priority air pollutants, and water resource management.

1.1.1. Stakeholder Input Process

The recommendations that follow are the results of an intensive two-month process in November and December 2007 to obtain stakeholder input from representatives of different types of industries, their suppliers, utilities, energy service companies, consultants and other interested parties. A total of seven workshops and six webcasts were held over an eight week period to provide opportunities for public input into this planning process. The opening workshop was held on November 5, 2007 immediately following the Pre-hearing Conference and included presentations from the convenor and a representative from KEMA on national and international industrial energy efficiency trends and energy efficiency potential in California industry, respectively. On November 13, a strawman developed by the convenor was posted to the website serve as a focal point for further discussion. Included in the strawman were outcomes from the Big Bold industrial workshop in June 2007, input from the November 5 workshop, and subsequent meetings with key industry groups and IOU representatives. An integrated approach was developed with the Agricultural team to address food processing. Finally, a core team was formed to move the industrial planning process forward that included representatives from the investor owned utilities, the CPUC, the convenors for industry and administrative staff.

Guest speakers from industry opened the subsequent half-day workshops with practical examples of results from their energy efficiency efforts. Of these, special workshops were held for food processing and water/wastewater. The workshops were organized around the following key questions from the strawman:

1. In a world of increasing energy prices and more constrained supply, how can energy efficiency help make California industry more competitive?
2. What is the potential for energy efficiency to assist industrial companies in meeting the requirements of AB32?
3. What would strengthen the value of energy efficiency to your shareholders? To your customers? To your employees? What is the role of regulation in strengthening or weakening this value?
4. What could be done to encourage greater energy efficiency in your supply chain (upstream and downstream)
5. What is the single biggest barrier to greater energy efficiency in your company?

The results of the workshops were used to identify topic areas and related key questions for the subsequent 1-1/2 hour webcasts. These topics included: energy resource utilization, workforce development, regulatory issues, and utility program design. A representative from the California Air Resources Board was invited to present on the topic of implementation of AB32 for the webcast on regulatory issues. Summaries from webcasts and workshops were posted in a timely manner and served to inform further discussions. A total of 134 individuals participated in these meetings, workshops, and webcasts, representing 82 different organizations, excluding members of the CPUC Industrial Team.[11] To obtain further input, meetings were held with the California Manufacturers and Technology Association (CMTA) and the California League of Food Processors (CLFP), as well as a conference call with a representative of the Silicon Valley Leadership Group (SVLG). A threaded discussion board was also established for the industrial sector on the website but had received limited use by the time that this report was generated.

1.1.2. Vision for California Industry

The major themes from the stakeholder process can be summarized as follows:

Theme 1: To maintain economic health in industry, the regulatory environment needs to be much better coordinated across energy, water, and air quality based on a comprehensive, shared, long-term vision of what the state hopes to accomplish through energy and environmental regulation. This coordination includes a need for greater industrial involvement in planning for implementation of AB32.

Theme 2: To respond effectively to this shared vision, industry needs the state to provide coordinated access to the technical assistance and program resources.

Theme 3: Utility programs limit industrial participation because: free-ridership rules are inconsistent with typical industrial practices, no provision is made for rewarding industrial facilities that have documented operational changes to improve energy management and efficiency, and incentives for very large projects are insufficient to meet internal hurdle rates for investment.[12]

Theme 4: Serious statewide attention needs to be given to training today's industrial workforce while also encouraging California's future workforce to consider careers in industry.

These themes are captured in the following draft vision for California industry in the year 2020.

Vision 2020: California Industry is Energy Efficient, Growing, and Profitable

1) California industries have market recognition for effective energy resource utilization and remain competitive:
   a. Industry has undergone a culture change so that active management of energy is fully integrated into daily operational practices - it has become "business as usual"
   b. Industry is managing energy use, GHG emissions reduction, water use, waste disposal, and air quality as a part of a comprehensive approach to effective resource utilization

[11] Of these, 60 organizations were either industrial or water/wastewater facilities or companies that provide services to industry

[12] Program initiatives exist that will permit incentives for operational changes if the company works with a specified utility third party, but market penetration is extremely small and independent actions are not eligible.

   c. The State of California publicly supports and recognizes industry's efforts to more effectively utilize energy and water resources, and to contribute to GHG reduction goals
2) Regional, state and local regulatory agencies provide well-coordinated, consistent regulatory policies that support California industry's efforts toward improving long-term effective utilization of energy resources while also achieving GHG reduction, water conservation, waste disposal, and air quality requirements.
3) Industry has coordinated access to energy efficiency and regulatory assistance via a statewide integrated program that supports the state's energy and environmental goals
4) Energy program offerings to industry are:
   a. Flexible
      i. designed to respond effectively to differing needs of industrial facilities (size, sector, operations)
      ii. may include structured contracts that assign value to assumed risk as well as to energy savings
   b. Well-aligned to industrial project development business cycles
   c. Comprehensive in scope (including all aspects of energy efficiency, demand response, load management, energy storage, combined heat and power, distributed generation, renewables, and emerging technologies)
5) California is a national leader in training industrial energy efficiency professionals

1.2. Sector Strategic Context

As previously mentioned, the purpose of this document is to provide a series of recommendations for industrial energy efficiency that 1) identifies a path toward achieving significant energy efficiency improvement and corresponding reductions in GHG emissions and 2) provides a context for maintaining, and perhaps improving, the competitiveness of California's industries in the process. It is important to note that, with the possible exception of small-size facilities, highly prescriptive approaches are neither well-received nor very successful for improving energy efficiency in industry. Most industrial facilities are highly organized around complex procedures designed to maintain operational efficiency and safety and must find their own path for integrating new goals and requirements that fit into these complex operational environments. The industry sector responds well to policies that establish a goal or target along with a range of acceptable parameters within which the company or facility can exercise considerable discretion on the specific method or path used for achieving the identified goal or target. For much of the industrial sector, growth of physical facilities is very limited, requiring energy efficiency efforts to focus largely on improvements to existing infrastructure.

If the recommendations included in this report are implemented, the potential energy savings will likely substantially exceed estimates previously cited for the maximum achievable energy savings potential. This would be due three factors:

1. an enhancement of current utility program incentives for energy efficient *projects* to include energy efficient *processes* (defined as documented, measurable evidence of energy management resulting in improved energy efficiency via projects, process, and operational improvements);

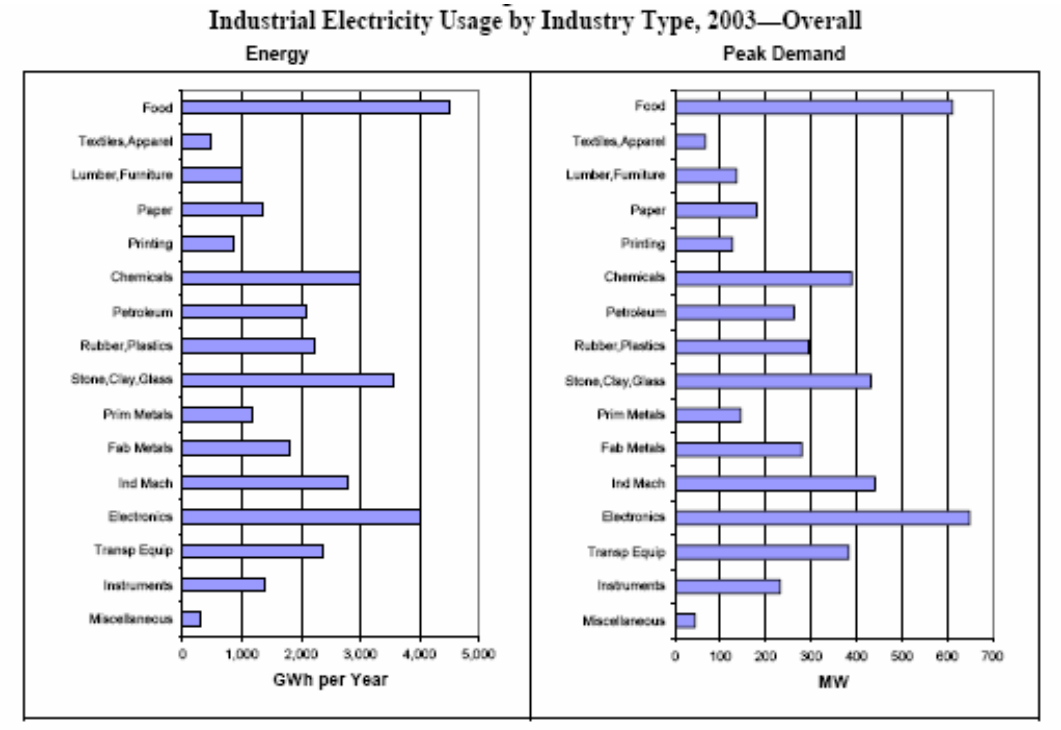
2. improved access to information about energy efficiency opportunities as well as technical assistance for realizing these opportunities, and

3. measurable improvement in the resources required of an industrial facility to document regulatory compliance.

Industry seeks a practical approach to regulatory compliance that is both more transparent and consistent with effective business practices. For example, the industrial sector is a substantial and underutilized resource for both combined heat and power and energy from biomass that remains largely untapped due to regulatory impediments. Without state leadership, it is likely that a short-term decline in the rate of energy efficiency improvement and many missed opportunities for utilizing alternative energy sources will occur in California's industries as management attention is diverted to address the uncertainty and perceived risk to economic survival associated with implementation of AB32. Effective state leadership would invite industry to work in partnership with state agencies to develop both a long-term vision and short-term strategies for achieving the state's environmental and energy efficiency goals.

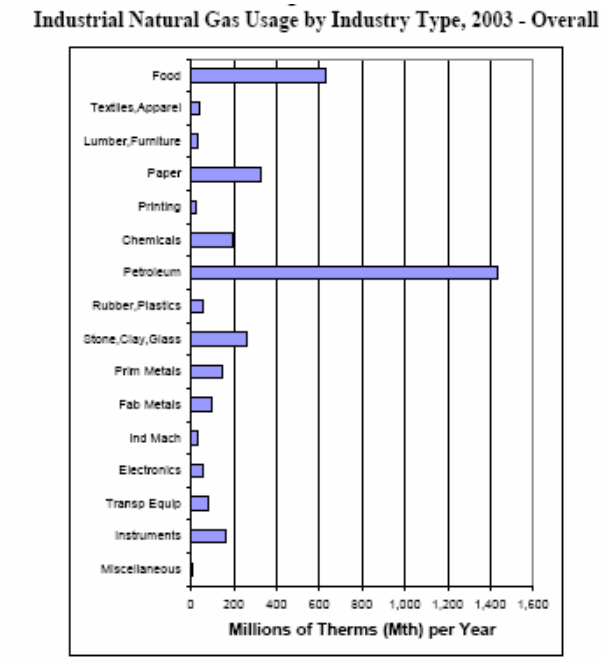
1.2.1. Market Profile: Key Stakeholders and Decision-makers

As previously mentioned, California industry is quite diverse. The following figure is from the 2006 KEMA report, California Industrial Existing Construction Energy Efficiency Potential Study, Appendix B.



Source: KEMA 2006, California Industrial Existing Construction Energy Efficiency Potential Study

The largest industrial users of electricity are food processing and electronics, although a number of other sectors have significant levels of use.



Source: KEMA 2006, California Industrial Existing Construction Energy Efficiency Potential Study

The largest user of natural gas is petroleum, with about half going to feedstocks, followed by food processing.

Although the water/wastewater community is not included in these energy potential estimates and is not addressed separately in this report, the themes and proposed strategies are equally applicable. It is important, however, to note some significant differences. Water and wastewater facilities are more numerous and dispersed than other industries, making outreach and education a greater challenge. The operation of these facilities is driven largely by permitting and public health issues. They represent a substantial percentage of many municipal budgets, are not mobile assets, and are tracking the growth in population occurring in some areas of the state creating more opportunities from new construction than elsewhere in industry.

The key stakeholders for California's industrial sector include:

- Industrial companies
- Industrial materials suppliers
- Suppliers of industrial equipment and services
- Trade associations (CMTA, CLFP, SVLG, California Large Energy Consumers Association [CLECA], Manufacturers Council of the Central Valley, National Electrical Manufacturers Association [NEMA], others)
- *Regional*, *state, and local regulatory agencies* (CPUC, Cal EPA, CARB, Water Resources Board, local air and water districts, etc)
- Investor Owned Utilities
- *Municipal Utility Districts* and Power Authorities

- California Energy Commission
- California Legislature
- Governor's Office
- CA Climate Action Registry
- US Department of Energy Industrial Technologies Program
- US EPA ENERGY STAR for Industry
- Energy Service Companies
- Consultants to industry
- US EPA CHP Partnership
- California Clean Distributed Generation Coalition
- Environmental groups
- Rate payer groups

The *italics* denote groups with a strong association with local government.

1.2.2. Barriers, Risks, Uncertainties

The most significant barriers to increased energy efficiency in today's industries are:

- regulatory uncertainty;
- conflicting regulatory goals;
- primary focus on production, not energy efficiency;
- resource limitations of both time and capital for assessment and implementation of energy efficiency projects;
- lack of awareness of energy efficiency opportunities;
- internal hurdle rates that often limit energy efficiency projects to paybacks of two years or less;
- utility program operating parameters based on compliance with current energy efficiency policies that unreasonably limit benefits/participation due to "free-ridership" rules, do not recognize or reward the benefits of documented process or operational changes, and limit or preclude very large projects that may result in substantial energy savings and corresponding GHG reductions;
- difficulty in accessing industry-relevant technical assistance;
- inadequate availability of highly qualified personnel in specialized industries.

1.3. Strategies

Strategy #1: Develop a shared vision and process for regulatory coordination

2009

Establish a framework for improved regulatory coordination and develop a shared vision for the state

Achieving well-coordinated, consistent energy and environmental regulatory policies across regional, state and local regulatory agencies that support California industry's efforts toward improving long-term effective utilization of energy resources while also achieving GHG reduction, water conservation, waste disposal, and air quality requirements will take time. The implementation of AB32 with its corresponding impact on both energy efficiency and GHG emissions drives the need for near term action. Developing a framework and a common vision will put a mechanism in place for further work from 2010 to 2020.

2010-2020

Develop and implement a comprehensive, coordinated long-term approach to the entire portfolio of regional, state, and local regulations affecting California industry's efforts toward improving long-term effective utilization of energy resources while also achieving GHG emissions reduction, water conservation, waste disposal, and air quality requirements.

Base this work on the framework and vision established in 2009-2011. Establish a review process for all new regulations that requires a written assessment of their impact on compliance with existing regulations and their consistency with the state's vision. Establish a feedback mechanism for periodically informing the Legislature concerning the efficacy of the coordination efforts.

Strategy target

The intent of this strategy is to create a framework that will provide California industry with 1) greater transparency in the range of regulations that impact their energy and water use, GHG emissions, waste disposal, and air quality and 2) greater regulatory consistency for future planning purposes. During the stakeholder process, industrial participants repeatedly voiced the opinion that regulatory uncertainty coupled with the lack of coordination among state agencies is counterproductive for both the industries and the state.

End-to-end vision

The broad-based approach envisioned will create a more favorable environment for industrial facilities to pursue energy efficiency improvements with confidence that they will also meet or exceed regulatory requirements for GHG emission reductions, water conservation, waste disposal, and air quality. Greater regulatory transparency will result in a net reduction in the amount of internal resources that an industrial facility or corporation must spend in interpreting regulations, attempting to resolve inherent conflicts in these regulations, and duplicative requirements for documentation. Properly structured, a coordinated regulatory framework could be coupled with incentives to

actively promote and reward measured performance improvements across energy, water, GHG emissions, waste disposal, and air quality.

Knowledge requirements

The interagency task force must include several knowledgeable industry representatives with direct experience with regulatory compliance, as well as regulatory decisionmakers from the affected agencies. Advisors to the task force should include individuals knowledgeable about industrial processes and technological innovation. In general, a statewide focus on standardized programs and metrics would be extremely helpful to industries who deal with multiple agencies and multiple IOUs.

Technology requirements

Attention will need to be given to new and emerging technologies and the potential role of regulatory requirements in encouraging or discouraging their use. At their most effective, these requirements would establish performance criteria and encourage innovative responses through incentives, rather than favor specific technologies. "Betting on winners" introduces a level of regulatory rigidity that can inadvertently skew or impede market innovation. A specific opportunity is to evaluate the best approach for dealing with food processing waste (millions of pounds annually), which might include linking the wastewater facilities having personnel skilled in operating digesters (and in some cases, excess capacity) with food processors under regulatory pressure to develop alternatives for dealing with their organic waste stream. [13]

Infrastructure requirements

Training will be required for industry, agency representatives, and code enforcement officials to introduce them in 2011 to the requirements of the coordination plan. A feedback mechanism will need to be established to periodically inform the Legislature concerning the results of coordination efforts.

Policy requirements

A political mandate will be needed from the Governor to initiate this process. Legislative action may also be required to fully implement coordination. Local agencies (especially air and water) will need to have representation in the regulatory coordination process. During the stakeholder process, participants frequently identified the need to address disincentives for combined heat and power. A specific recommendation was the need for a CPUC-approved cost-benefit methodology for onsite power production- both combined heat and power and distributed generation.

Marketing, Education and Outreach Requirements

A comprehensive outreach campaign will be needed, initially to explain the coordination process, then to engage industry during public comment periods, and finally to notify industry and the companies that serve them of the impact of the coordinated approach.

[13] The section on Bioenergy for Electricity Production in the *2007 Integrated Energy Policy Report* makes reference to the California Department of Food and Agriculture's work with farmers to harness dairy and food wastes as a source of energy. What is proposed here concerns organic wastes from *food processing facilities*, especially fruit and vegetable processors.

Financing Requirements

The principal investment required is political will. Additional funding will be needed to support the staff required to move this process forward. The sources and amount of funding need further development.

Demand Side Management Integration Requirements

This strategy is very broad, encompassing energy, GHG emissions, water use, waste disposal and air quality. The energy aspect of the strategy pertains to energy resource utilization, including energy efficiency, demand response, load management, energy storage, combined heat and power, distributed generation, renewables, and emerging technologies.

Action Plan

- Who leads?

  Governor's office, state agencies, Legislature

- Who must be involved?

  Industry, industrial associations, state agencies, regional and local water and air districts, utilities, equipment manufacturers

- Timing (Short-, Medium-, Long-Term actions)

Proposed timing and metrics for measuring progress toward the target:

September 2008	Establish a interagency task force through the Governor's office to develop a framework for improved regulatory coordination
January 2009	Draft vision and framework available for public comment
April 2009	Final vision and framework published
May 2009	Implement framework and commence interagency regulatory gap analysis; including any necessary legislative action
April 2010	Draft interagency coordination plan available for public comment
May 2010	Submittal of any draft proposed legislative actions
October 2010	Comments due on interagency plan
November 2010	Final package of proposed legislative actions
May 2011	Final interagency coordination plan published
July 2011	Implementation of coordination plan commences

Strategy #2: Greater engagement of industry in planning AB32 implementation

Facilitate the direct involvement of industry in coordinated interagency planning for the energy efficiency portions of AB32 implementation.

As part of this activity, examine the potential benefits demonstrated by negotiated agreements to promote industrial energy efficiency and to help meet the goals of AB32.

While acknowledging that the Air Resources Board has already taken steps to engage industry via the Economic and Technology Advancement Advisory Committee (ETAAC), efforts to more broadly engage industry in identification and accounting for early actions would be very beneficial in assisting the state in meeting the goals of AB32. A Climate Action Team for Industry is needed to ensure that industry has a direct voice in the planning process. California would also benefit from studying the positive contributions to industrial energy efficiency, and corresponding reduction in GHG emissions, that have been demonstrated through the use of negotiated agreements in Europe, especially in the United Kingdom, the Netherlands, and Sweden. In these countries, negotiated agreements with industry have been used to achieve energy savings and corresponding GHG emission reductions of 20% or more.[14]

Strategy target

The immediate target is to directly engage industry in the planning process for AB32. The longer term strategy is to facilitate industry involvement in coordinated interagency planning for the energy efficiency portions of AB32. This would include examining the potential benefits of negotiated, legally binding agreements with the chief operating officers (CEOs) of industrial corporations as a policy mechanism to promote energy efficiency in industry and corresponding reductions in GHG emissions. If negotiated agreements are selected as a policy mechanism, a coordinated agency approach would be needed to negotiate targets with specific industrial sectors and to tailor technical assistance, financial incentives, and penalties to facilitate meeting these targets.

End-to-end vision

Industry involvement in the energy efficiency portions of AB32 planning needs to occur during the first quarter of 2008, before work on the draft Scoping Plan is completed. Of particular concern is the impact of AB32 baseline requirements on industrial facility actions to improve energy efficiency. New policy guidelines are also needed regarding free-ridership for industrial utility incentive programs that encourage, rather than discourage, compliance by industrial facilities with AB32 (see Strategy #4).

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[14] Excerpted from *Policies for Promoting Industrial Energy Efficiency in Developing Countries and Transition Economies*, McKane, A., L. Price, S. de la Rue du Can

"The UK Climate Change Program was established in 2000 to meet both the country's Kyoto Protocol commitment of a 12.5% reduction in GHG emissions by 2008-2012 relative to 1990, and the domestic goal of a 20% CO2 emissions reduction relative to 1990 by 2010 (DEFRA, 2000). A key element of the Climate Change Program is the Climate Change Levy, which is an energy tax applied to industry, commerce, agriculture, and the public sector. Certain companies can also participate in Climate Change Agreements (CCAs). There are 44 sector agreements representing about 5,000 companies and 10,000 facilities. The goal of the CCAs is to reduce carbon dioxide emissions by 2.5 MtC (9.2 MtCO2) by 2010, which is ten times the estimated savings from the Climate Change Levy without the agreements. During the first target period (2001-2002) total realized reductions were three times higher than the target for that period (Pender, 2004). Sectors did better than expected because industry underestimated what they could achieve via energy efficiency. Industry realized total reductions that were more than double the target set by the government during the second target period (Future Energy Solutions, 2005)."

The longer term strategy is to cooperatively develop and implement policy mechanisms, such as legally-binding negotiated agreements, that have a proven track record in promoting industrial energy and corresponding reductions in GHG emissions. The purpose is to assist the State in meeting the goals of AB32 for a 173 MMT CO_2e Reduction by 2020 and a 341 MMT CO_2e by 2050. The top 15 industrial sectors for CO_2 emissions emit approximately 92 $MtCO_2$ annually. [15] A 15% reduction in emissions or 14 $MtCO_2$ across these sectors should be achievable by 2020 using available technology. A 20% reduction would produce a reduction of 18 $MtCO_2$. The advantage of negotiated agreements with industry is that, unlike the residential, commercial, and transportation sectors, there are relatively few firms involved.

Knowledge requirements

Due diligence is needed to study the details of the negotiated agreement program designs and implementation strategies in the United Kingdom, the Netherlands, and Sweden. In addition, the US Department of Energy Industrial Technologies Program has considerable technical assistance resources and has begun development of a national voluntary agreement program to reduce energy intensity in industry under the auspices of Energy Policy Act (EPAct) of 2005, Section 106. The US Environmental Protection Agency's ENERGY STAR for Industry program has experience with Climate Leaders and has developed helpful energy management resources (see also Strategy #3). Finally, a number of U.S. companies have substantial corporate experience with management-driven energy efficiency targets.[16]

Technology requirements

There are no specific technology requirements for implementation, although the long-term strategy could include incentives to encourage a variety of energy efficiency improvements, including, where appropriate, new technologies.

Infrastructure requirements

For the short-term strategy, no additional infrastructure is required. For the long-term strategy, if negotiated agreements are selected as a policy mechanism, managers of industrial facilities and utility representatives would need orientation to the goals and reporting requirements. Technical assistance will be needed, but could be adapted from existing programs at the national (USDOE, USEPA), regional (NEEA), and state (TX, WI) level. Participants in negotiated agreements who also agree to become certified (see Strategy #3) would have access to training and other resources available through that national program. Regulatory conflicts with the potential to impede full compliance would need to be evaluated as part of the coordinated framework described in Strategy #1.

Policy requirements

The short term strategy of industrial involvement in AB 32 planning requires no policy changes and could be accomplished at the agency level under existing policy structures.

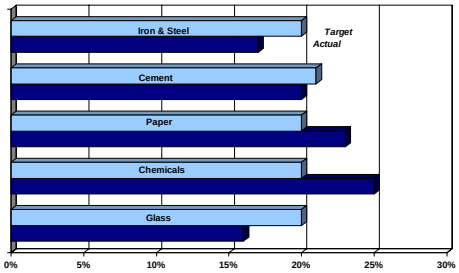
[15] Murtishaw, S., De La Rue du Can, S,. Price, L., Masanet, E., and Simcich, M., 2006. CALEB: California Energy Balance Database, Berkeley, CA: LBNL

[16] Examples include: 3M, Dupont, Dow, FritoLay, Toyota North America, United Technologies, Raytheon

Further study is needed to determine whether negotiated agreements could be implemented as an element of AB32, or whether they would require special legislative action. It is important to note that while negotiated agreements in the UK, Netherlands, and Sweden emerged as policy response for addressing an energy tax--thus creating a clearly defined "carrot" (tax relief) and "stick" (tax levies)--the program in California as it is currently envisioned would have a different principal driver. In California, the principal benefit to industry would be *the ability to structure and effectively manage its response* to GHG reduction regulations in a manner consistent with sound business practices and the specific situation of each participating company.

Targets for negotiated agreements are typically negotiated by industrial sector, either via a trade association or cluster. For example, Long-Term Agreements took the form of contracts between the Dutch Minister for Economic Affairs and associations representing 29 industrial sectors (1250 firms) representing 90% of industrial energy consumption. In the U.K., the government signed agreements with either industrial sector associations or individual companies representing 44 sectors (about 5,000 companies and 10,000 facilities) responsible for 90% of energy-intensive industry. In each case, the agreements required a legally-binding contract signed by the CEO of each participating company.[17]

Netherlands Long-Term Agreements on Energy Efficiency



% improvement in energy efficiency, 1989-2000

Results:

- Overall energy efficiency savings of 22.3% realized
- 157 PJ or 9 MtCO2/year saved
- 1/3 to 1/2 of the savings stimulated by the agreements (remainder was autonomous)
- Cost to government of program was $10-20/tCO2 saved, depending upon whether full costs of all subsidies are included
- Industry realizing ~$650 M per year in reduced energy costs

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Source: L. Price, March 5, 2007 presentation to CARB

[17] Price, L.K. *Near-Term Solutions for Mitigation of Industrial Sector Carbon Dioxide Emissions in California*, presentation to the California Air Resources Board, International Symposium on Near-Term Solutions for Climate Change Mitigation in California, March 5, 2007. For a broad global overview, see also L. Price, *Voluntary Agreements for Energy Efficiency or GHG Emissions Reduction in Industry: An Assessment of Programs Around the World,* published in the Proceedings of the 2005 ACEEE Summer Study on Energy Efficiency in Industry, http://industrial-energy.lbl.gov/node/107

Marketing, Education and Outreach Requirements

A series of seminars would be needed to educate industrial representatives directly and via their industrial associations on the purpose and goals of such agreements both prior to and after negotiations. Technical assistance will be needed for implementation. Examples of supporting policies used for implementation in the Netherlands included: subsidies, energy investment tax reduction, information dissemination, energy audits, simplified procedures for environmental permits, and consistency in and protection from new energy regulations.

Financing Requirements

Financial incentives will be needed for implementation of the agreements. One source of funding could result from linking a percentage of the public benefits charge to participation in agreements; another source of funding could be from funds set aside for implementation of AB32. Whatever the source, the primary purpose of incentives (technical assistance, very low interest loans from a revolving fund, rebates, other) should be to accelerate adoption of changes in operations and processes that result in increased energy efficiency and corresponding reductions in GHG emissions from energy efficiency improvements. Successful programs in Europe typically link a phased-in energy or carbon tax to corresponding tax relief for achieving agreement targets (see also Policy Requirements).

Demand Side Management Integration Requirements

The energy aspect of the strategy pertains to energy resource utilization, including energy efficiency, demand response, load management, energy storage, combined heat and power, distributed generation, renewables, and emerging technologies.

Action Plan

- Who leads?

ARB with assistance from the CPUC and CEC

- Who must be involved?

Industry; industrial associations; state agencies; state, regional, national, and international policy experts; utilities; local government

- Timing (Short-, Medium-, Long-Term actions)

Short- by March 2008, establish a Climate Action Team for Industry to participate in AB 32 planning

Longer Term – work with the Climate Action Team for Industry to to study the feasibility of implementing negotiated agreements.

Strategy #3: Provide market recognition for resource-efficient facility operation

Provide market recognition via a label or certification for industrial facilities that meet defined criteria for continuous improvement in the utilization of energy resources and GHG emissions reduction (could also include water resources, waste management, and improved air quality)

Full integration of energy resource utilization with corresponding GHG emission reductions will require a significant effort from "early adopters". Companies that are willing to provide leadership in this area should be recognized. A label or certification would provide ongoing recognition of efforts that could add value to customers, shareholders, and the financial community.

Strategy target

This strategy provides a set of performance criteria for companies that seek to exceed minimum regulatory requirements and any negotiated agreement targets by actively managing their energy use over time. One approach would be to join the "Superior Energy Performance Partnership", an existing national effort to improve energy management through certification of plants for energy efficiency being led by the USDOE, the USEPA, the Manufacturing Extension Partnership, and a number of industrial firms (including 3M, Dow, Dupont, Ford, Toyota, Sunoco). [18] Re-certification would be required every three years. This approach would complement the opportunity to receive an ENERGY STAR in any given year, available for selected sectors for performing in the top quartile for energy intensity.[19]

End-to-end vision

Industrial energy efficiency is a complex topic. By participating in a recognized national effort to certify industrial facilities for energy efficiency, California would be assisting its industries to:

1. more easily reach their GHG emission reduction targets via a supported, structured program based on proven best practices;
2. develop market recognition for their energy efficiency and GHG reduction efforts through third-party certification, thus increasing global competitiveness, especially for industries that market directly to customers, and
3. provide a tangible way to encourage greater energy efficiency throughout their supply chain.

Planning for the national certification program is underway now, with a pilot program scheduled in Texas for mid-2008 through mid-2009. California has the opportunity to join the initiative while it is still under development in order to: 1) ensure that the certification program, including the M&V methodology, is compatible with other industrial energy efficiency and GHG emission reduction program initiatives and regulations in the

[18] For details, see http://www.superiorenergyperformance.net/ and , also related paper: A. McKane, P. Scheihing, and R. Williams, 2007, *Certifying Industrial Energy Efficiency Performance: Aligning Management, Measurement, and Practice to Create Market Value,* published in the Proceedings of the 2007 ACEEE Summer Study on Energy Efficiency in Industry, http://industrial-energy.lbl.gov/node/408 .

[19] http://www.energystar.gov/index.cfm?c=business.bus_bldgs

state (especially AB 32), 2) afford an opportunity for California industries to provide comments and input into the program design, and 3) build on the experience in the Texas pilot to become an early adopter of the certification program, with its attendant cost-share and recognition opportunities from USDOE and other partners.

The national certification program is scheduled to be launched in 2010.

Knowledge requirements

Utility, key industry, and CEC representatives would need to become knowledgeable about the purpose and structure of the certification program. Participation on a review committee would be anticipated and additional participation would be beneficial. The first product of the Superior Energy Performance initiative is the Quick Start website.[20]

Technology requirements

There are no specific technology requirements for this strategy

Infrastructure requirements

Training will be needed to prepare a cadre of industry professionals (consultants, plant engineers in larger facilities, and equipment suppliers and service providers) to provide energy management assistance, in-depth system assessment services, and resource utilization assistance. An element of the certification program is the creation of ANSI-recognized Certified Practitioners in energy management and in four different system categories (compressed air, pumping, steam, and process heating), with additional categories planned. The certification program will be strongly supported by the Superior Energy Performance Partnership, especially by USDOE via the MEPs and others, with technical resources and training programs.

Training will also be required for industry to effectively use energy management and system assessment standards

(Could leverage with Strategy #4)

Policy requirements

The policy instruments that are essential for implementing this strategy include the American National Standards Institute (ANSI) energy management standard MSE 2000:2005, currently being revised by Georgia Institute of Technology, and ANSI system assessment standards, now under development through the American Society of Mechanical Engineers. Also useful would be the negotiated agreements described in Strategy #2.

A market analysis should also be conducted to determine linkages and potential overlaps between the proposed certification program and other certification programs or labels (e.g. metrics for data centers, “green chemicals”, LEED, etc).

Marketing, Education and Outreach Requirements

If the strategy is to succeed, California industry would need to be convinced of its value, both to their facilities and their markets. Targeted outreach is anticipated to explain the initiative, perhaps focused initially on facilities with negotiated agreements.

[20] http://www.energyquickstart.org/quickstart/index.asp

Financing Requirements

Funding would be needed to conduct the pilot program- especially to assist companies in implementing their energy management plans. Substantial cost share will likely be available from the USDOE Industrial Technologies Program, with additional in-kind support from EPA's ENERGY STAR.

Demand Side Management Integration Requirements

Integration of demand side management would be a highly desirable feature of this strategy and would be consistent with Strategies 1-3.

Action Plan

- Who leads?

CPUC, CEC, Utilities, Manufacturing Extension Partnership

- Who must be involved?

CPUC, CEC, Utilities, Industry, USDOE, Industrial Associations, USEPA

- Timing

2009- participate in national planning process

late 2009- pilot certification program in 8-10 California industrial facilities

2010- publish results of pilot and determine whether to fully launch a statewide program

2011- depending on decision, launch statewide certification program

Strategy #4: Provide centralized technical and regulatory assistance for resource efficiency

2009-2011

Develop and launch seamless, centralized, statewide access for California industry to technical assistance to support more effective utilization of energy resources.

Conduct pilot demonstration projects with 2-3 industrial sectors to test new program concepts.

2012-2020

Provide greater flexibility in the operational policies of utility programs that promote industrial energy efficiency in order to: remove barriers to participation, promote industrial competitiveness and longevity, and support allied environmental goals.

Extend statewide access for California industry via an Industrial Resource Efficiency Alliance to technical and regulatory assistance to support more effective utilization of energy and water resources, GHG reduction, waste disposal, and improved air quality.

Industry provides a substantial percentage of the ratepayer funds used for California's utility energy efficiency programs. While recognizing that these funds exist to provide a public benefit,

California industry would like the opportunity to more fully realize its potential to substantially contribute to the overall energy efficiency of the state. The intent of these recommendations is to build on the successful efforts of the IOUs to provide programs for the industry market and to apply the experience of these programs to broaden, enhance, and better target these services.

Industrial facilities are not just large buildings that can be effectively served by programs designed for the commercial sector—their principal use of energy is to create products or transform materials. Most industrial facilities have management systems in place for materials, labor, and other resources that could be enhanced to include energy management as well as other environmental factors, but international experience has demonstrated that these changes will not become widespread without supporting policies and programs. The goal is to develop supporting policies for continuous improvement in California industry for resource utilization, encompassing all aspects of energy utilization, GHG emission reduction, water conservation, waste disposal, and air quality.

Strategy target

The first phase of this strategy (2009-2011) is to develop a process of seamless, centralized, statewide access for California industry to support more effective utilization of energy resources. The immediate vision for centralized access is a well-coordinated network with a single source of access that builds on and fills in the gaps in existing partnerships and relationships in the industrial sector. [21] This phase would also be used to demonstrate new programmatic approaches and to evaluate their effectiveness for California's industrial sector. The food processing industry, with the leadership of the California League of Food Processors in partnership with the Manufacturers Council of the Central Valley, has requested support for a pilot demonstration of a combined approach to energy resource utilization, GHG emissions reduction, water management, waste management, and air quality (see Attachment A). This pilot could also contribute practical knowledge toward the goal of improved regulatory coordination. An additional one to two sectors should also be selected for pilot demonstrations of the proposed new approaches.

The second phase of this strategy (2012-2020) is to use the lessons leaned from the first phase, as well as experience from other states and regions, to implement substantial changes in utility program incentives for industry. The objective of this strategy is to better match utility program incentives to the needs of industry and thus foster greater energy efficiency across the industrial sector for program dollars spent.

The centralized, statewide access for California industry will be extended to technical and regulatory assistance across energy, water, GHG emissions, waste disposal, and air quality via an Industrial Resource Efficiency Alliance, a clearinghouse established for this purpose.[22] An important element of the technical assistance is to provide access to individuals with practical knowledge of industry needs. For major industrial sectors, this could include managers and engineers who have retired from the industrial sector.

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[21] Examples of these industrial relationships could include: industrial trade associations, utility industrial account representatives, industrial vendors and service providers who agree to become allies by undergoing targeted training and agreeing to promote energy efficient practices, etc.

[22] One model, although more limited than what is suggested here, is the Industrial Efficiency Alliance established under the auspices of the Northwest Energy Efficiency Alliance in partnership with the Northwest Food Processors Association and the Technical Association for the Pulp and Paper Industry http://www.industrialefficiencyalliance.org/

End-to-end vision

First, an enhancement of current utility program incentives for energy efficient *projects* to include energy efficient *processes* (defined as documented, measurable evidence of energy management resulting in improved energy efficiency via projects, process, and operational improvements*)*. While prescriptive approaches can be useful, particularly for smaller facilities, larger facilities would be more likely to develop energy savings projects from a negotiated approach based on incentives for delivered energy savings, whether from hardware installations or documented, permanent changes in operational processes. This contract mechanism could be structured so that the facility "guaranteed" delivery of a specified minimum amount of energy savings, demand response, or onsite generation - with financial penalties levied or additional incentives rewarded based on the level of actual performance. A specific recommendation was the need for a CPUC-approved cost-benefit methodology for onsite power production- both combined heat and power and distributed generation.

Second, for large "game changing" process changes, utility incentives need to be negotiated based on the value and certainty of the energy savings offered rather than arbitrarily capped. While some limits will be needed to ensure that access to incentives is not limited to a very few, much more flexibility in the amount of allowable incentives is needed.

Third, utility program rules regarding early replacement need to recognize the reality of industrial decision making. For example, limiting the incremental benefit of equipment replacement to current technology benchmarks fails to recognize that without the utility program as a driver, many types of industrial equipment (e.g. large motors or pumps) would not be replaced for years or even decades until the equipment reaches the end of its useful life. A more useful approach would be to approximate the energy efficiency of the existing equipment and its remaining useful life and include that value as part of the calculated "net benefit" from the installation of energy efficient equipment, in addition to the incremental benefit accrued beyond the life of the existing equipment from the selection of an energy efficient choice among current replacement options.

Fourth, new policy guidelines are also needed regarding free-ridership for industrial programs that encourage, rather than discourage, compliance by industrial facilities with other regulations, including those affecting GHG emission reductions, water use, waste disposal, and air quality. As previously mentioned, lack of regulatory coordination and regulatory uncertainty create conditions in which parent corporations may view the most cost-effective options to be either reducing production levels or leaving California.

The goal is to provide continuous evolution and enhancement of utility incentive programs for industry based on regular feedback from industrial customers, consultants, service providers, and other stakeholder groups coupled with regular, targeted program evaluations.

Knowledge requirements

Analysis needs to be conducted concerning how the proposed changes in utility program incentives would be implemented and evaluated. These analyses should be conducted by a team that includes industry representatives that have practical knowledge of industrial operations, as well as analysts and utility representatives more traditionally associated with these functions.

Technology requirements

The proposed program changes do not require new or emerging technologies to be successfully implemented; however, there are new policy instruments and technologies that would accelerate the resulting energy savings. The policy instruments are described in the policy requirements section.

The market for advanced energy management controls in industry or energy enterprise management is still quite immature, but emerging rapidly. Early entries into this market have focused largely on load management, but these same tools and strategies hold significant promise for integration into an automated demand response framework. Similarly, the emergence of higher quality system level network controls provide the missing link that would allow much tighter management of energy end use, and thus both greater opportunities for energy efficiency as well as demand response. The complete controls integration of load management, demand response, and energy efficiency across an entire industrial plant may be within reach of many plants within the next decade.[23]

Information on emerging technologies is available but difficult to find. A statewide clearinghouse would be helpful. Research and demonstration of a number of promising technologies has been supported by CEC-PIER.[24] Sector profiles are available for food processing, computers and electronics, semiconductors, chemicals, and petroleum refining. Industry-specific research roadmaps have also been developed for the petroleum, food processing, and water/wastewater industries.[25] A national study of emerging technologies is available that includes an evaluation of implementation issues.[26] A study of emerging technologies for the food processing industry is included on the energy portal shared by the California and Northwest food processing associations. [27]

Barriers to integrating new technologies include: operational risk- real and perceived; cost; and potential down time.

Infrastructure requirements

Training will be needed to prepare a cadre of industry professionals (consultants, plant engineers in larger facilities, and equipment suppliers and service providers) to provide energy management assistance, in-depth system assessment services, and resource utilization assistance. Existing programs, such as those offered by USDOE's Industrial Technology Program and USEPA's ENERGY STAR for Industry could provide substantial cost-share opportunities and in-kind assistance, respectively- especially if linked to certification.

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[23] McKane, A, M.A. Piette, D.Faulkner, G.Ghatikar, A. Radspieler, et al. 2007 [final draft] *Opportunities, Barriers, and Actions for Industrial Automated Demand Response in California*, Demand Response Research Center for the California Energy Commission

[24] http://www.energy.ca.gov/pier/iaw/projects/industrial.html ; http://www.energy.ca.gov/process/industry/index.html

[25] http://www.energy.ca.gov/pier/iaw/iaw_sectors.html ; http://www.energy.ca.gov/publications/searchReports.php?pier1=IAW%20End-Use%20Energy%20Efficienc

[26] Martin, N., E.Worrell, M. Ruth, L. Price, R. N. Elliott, et al. 2000. *Emerging Energy-Efficient Industrial Technologies*. http://industrial-energy.lbl.gov/node/108

[27] http://www.nwfpa.org/eweb/startpage.aspx?site=Energy&design=no

Training will also be required for industry to effectively use energy management and system assessment standards.

Policy requirements

The CPUC would need to modify both its current policies governing industrial energy efficiency incentives and the measurement and validation processes used to evaluate results. It is unclear whether any legislative action would be required.

The policy instruments that would be most helpful include the ANSI energy management standard MSE 2000:2005, currently being revised by Georgia Institute of Technology, and ANSI system assessment standards, now under development through the American Society of Mechanical Engineers. Also useful would be negotiated agreements described in Strategy #2.

Marketing, Education and Outreach Requirements

An educational and outreach program will be required to build awareness in industry concerning new program offerings and how to access them.

Financing Requirements

Current funding levels will need to be increased temporarily to build statewide capacity for energy management and system assessment professionals. Substantial cost share may be available from the USDOE Industrial Technologies Program, with additional in-kind support from EPA's ENERGY STAR.

Demand Side Management Integration Requirements

This strategy requires complete integration of demand side management, to be accomplished through changes in regulatory coordination and utility program operational policies.

For some sectors, such as fruit and vegetable processing, peak production is coincident with peak statewide electricity use. Substantial concerns have been expressed by these industries concerning their structural inability to respond to dynamic pricing during the summer months. Suggestions include "teaming" with other sectors that have this potential to build greater reliability into the grid without adverse consequences to their operations.

Action Plan

- Who leads?

  Utilities, CPUC, California Energy Commission

- Who must be involved?

  Industry, industrial associations (especially the California League of Food Processors, Manufacturers Council of the Central Valley), utilities, CPUC, California Energy Commission, USDOE, USEPA, industrial equipment suppliers, industrial service providers, consultants

- Timing

2009-2011

- Develop and launch seamless, centralized, statewide access for California industry to technical assistance to support more effective utilization of energy resources.
- Conduct 2-3 pilot demonstrations, including the food processing industry (see attached), to test proposed changes in utility programs to:
    1. provide utility incentive programs for energy efficient processes (defined as documented, measurable evidence of energy management resulting in improved energy efficiency via projects, process, and operational improvements) using a negotiated approach based on incentives for delivered energy savings, whether from hardware installations or documented, permanent changes in operational processes;
    2. for large "game changing" process changes, provide utility incentives based on the value and certainty of the energy savings offered rather than an arbitrary cap, and
    3. revise rules regarding "free-ridership" and early replacement to recognize the reality of industrial decision making, including regulatory coordination
- Provide ongoing feedback from annual evaluations of program results to assist utilities in "continuously improving" new program offerings

2012-2020

- Extend the seamless, centralized, statewide access for California industry to technical and regulatory assistance to support more effective utilization of energy and water resources, GHG emissions reduction, more effective waste disposal, and improved air quality.
- Include as changes to utility incentive programs those elements that tested well during the 2009-2011 pilot demonstration period.

Strategy #5: Support industrial energy efficiency workforce development

2009-2011

Create a comprehensive framework for industrial energy efficiency workforce development

2012-2020

Fully implement California's workforce development program for industry resulting in an influx of qualified workers and students

Data shows that while California companies need and want qualified workers, the United States isn't preparing workers for the new economy. According to the most recent available data, 30

percent of applicants have the wrong skills for available jobs (U.S. Chamber of Commerce, 2002) and more than 80 percent of manufacturers reported a shortage of qualified candidates (National Association of Manufacturers, 2001). Many in-state companies can't fill positions in fields like biotech, impacting their ability to compete successfully (Bay Area Economic Forum, 2005).[28]

Industry would like to build on the Governor's "Get REAL" Campaign for Career and Technical Education with specific strategies from K- college, including technical and vocational education, that are designed to link "green" educational initiatives, such as energy efficiency, with secure, well-paying technical careers in sustainable industries. [29] In addition, orientation programs for new workers need to be expanded beyond traditional topics such as safety to address their personal role in the energy efficiency and sustainability of the company.

Strategy target

The first phase of this strategy is designed to conduct an assessment of resources (programs, organizations, funding) that could be applied to workforce energy efficiency development activities. There are two goals for workforce development:

1. to develop an integrated framework of initiatives that are targeted to increasing the interest of young adults, especially high school and college students, in industrial careers. The message that needs to be conveyed to these students is that highly technical and well-paying "green collar" jobs[30] can be found in the industrial sector that can make a positive contribution to climate change mitigation, and
2. to better prepare both management and line workers to more effectively manage energy in their facilities.

The second phase of the strategy is to fully develop and implement California's workforce energy efficiency development program for industry. The overall goal for the program is to

1. resolve the shortage of qualified industrial energy efficiency workers in the near and long term, and
2. attract students from out of state to come to California to study to become industrial energy professionals

The goal of this strategy is to prepare existing workers to be receptive to the organizational changes envisioned in Strategies 1-3 and to create attractive careers for new workers that afford them opportunities to grow.

Knowledge requirements

The planning process required needs to be extensive, iterative, and involve a number of stakeholders to ensure that long-term planning by educational institutions has and maintains relevance to industry energy efficiency needs. Analysis of existing programs,

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[28] Office of the Governor; http://gov.ca.gov/index.php?/press-release/5618/

[29] http://www.epa.state.oh.us/pic/education.html

[30] For a description of Oakland's efforts, see http://www.yesmagazine.org/article.asp?ID=1551 ; for one view of "green collar" (not as focused on industry as what is proposed here), see Alan Thein Durning, *1999. Green Collar Jobs: Working in the New Northwest*, Northwest Environment Watch, ISBN-13: 9781886093089

such as the K-12 educational initiative in Ohio, need to be studied, along with existing California programs such as the "Get REAL" campaign.

Methods for recognizing a defined set of skills need to be considered. Models include: Building Operator Certification, Certified Energy Management Practitioner, Certified System Practitioner, and Certified Energy Manager. SVLG is also undertaking a related effort, still under development.

Technology requirements

Communication technologies (webcasts, e-learning, etc) are likely to be used.

Infrastructure requirements

Training requirements will be identified as part of the workforce development planning process

Policy requirements

- TBD by workforce energy efficiency development working group

Marketing, Education and Outreach Requirements

The goal of this strategy is to prepare existing workers to be receptive to the organizational changes envisioned in Strategies 1-3 and to create attractive careers for new workers that afford them opportunities to grow.

Financing Requirements

- TBD by workforce energy efficiency development working group

Demand Side Management Integration Requirements

- Not applicable

Action Plan

- Who leads?
  - CA Labor and Workforce Development Agency Employment Development Department (EDD)- Clean tech workforce training program
  - Industrial Associations
- Who must be involved?
  - Industry
  - Industrial Associations
  - CA Labor and Workforce Development Agency Employment Development Department (EDD)- Clean tech workforce training program
  - CA Partnership for the San Joaquin Valley
  - Energy Service Companies

  - Trade schools and union trades training programs
  - Community colleges
  - Private colleges
  - UC system, especially Merced, Davis, Berkeley
  - Cal Polytechnic
  - Cal State Fresno
  - County workforce development trainers
  - State Dept of Education
  - Engineering Societies such as American Society of Mechanical Engineer and the Association of Energy Engineers
  - Utilities
- Timing (Short-, Medium-, Long-Term actions)
  - TBD by workforce development working group
- Metrics and timing for tracking strategy implementation and revising plan as needed
  - TBD by workforce development working group

Attachment A:

California's Food Industry Pilot Demonstration Resource Efficiency Initiative

1/3/08 Draft

Major Themes:

1: As the third largest industrial energy user, the food processing industry is proposing a pilot program to demonstrate an integrated approach to energy resource utilization, water conservation, GHG emission reduction, waste disposal, and air quality.

2: The primary objective is to create a Food Industry Resource Efficiency Alliance that can be used as an example to transform Public Goods Charge program efforts while also improving the competitiveness of California' food processing industry. The outcome will result in facilities that:

- continuously improve energy efficiency through the application of energy management best practices;
- reduce water use, while reusing and recycling water resources;
- limit air pollution and GHG emissions, and
- capture solid and liquid waste streams to generate bio-energy products.

3: A key factor to the success of the program is to establish a new resource accounting methodology that encompasses the marginal economic benefits achieved in each of the resource streams. The pilot program will implement resource efficiency benchmarks and resource efficiency incentives holistically, rather than end-product efficiency benchmarks.

Phase 1 Strategies: The effort will focus on a small sample of companies (from fruit and vegetable processing, dairies, wineries) to develop a pilot program that could eventually be applied across the entire industry and to other manufacturing sectors.

<u>Program Planning:</u>

- Collect and analyze information on existing programs that address aspects of resource utilization best practices;
- Establish criteria for pilot site selection (select representation from categories based on energy and other resource use, size, type, operations, stakeholder group, management commitment);
- Establish resource efficiency targets for the program;
- Develop matrix of supporting information and resources for managing facility resources and determine best method of delivery for this information, and
- Identify the resource requirements for effective participation by the pilot facilities (staff, outside assistance, other).

At each pilot site:

- Build a corporate commitment;
- Establish a process for integrating resource utilization across the company (team or other);
- Identify specific program participation requirements for the pilot site;
- Collect baseline data to develop a resource utilization map
    - Identify data gaps,
    - determine need for additional metering, monitoring, and measuring to develop a more complete picture, and
    - develop a plan for installation of needed metering, monitoring, and measurement devices and processes (in cooperation with IOU);
- Benchmark performance against best practices for resource utilization, where such information exists;
- Provide appropriate training to better manage their resources, including, at minimum, energy management training;
- Assist the in establishing a resource utilization plan, based on continuous improvement, with short and long term company-specific targets;
- Develop an internal communication strategy and processes to engage all employees in the resource utilization plan at an appropriate level;
- Identify regulatory and other obstacles to realization of the resource utilization plan;
- Identify and Implement best practices;
- Examine the feasibility of new and emerging technologies, and
- Identify cost-effective projects for funding.

Implementation

- With significant support from the IOUs, CEC, and other relevant state and local agencies, test program modification proposals from Strategy #4 of the Industrial Statewide Strategic Plan.

Program Evaluation

- Provide feedback to the IOUs, CEC, and other relevant state and local agencies on the efficacy of these proposed modifications, and
- Provide input to CPUC pilot demonstration program evaluation.

Phase 2 Strategies: The second phase of this project would consist of funding the priority resource efficiency projects identified in Phase 1; assist in the implementation of these projects, and conduct an assessment of benchmarks achieved by the target projects.