Marketing, Communications, and Public Education Topic Team Report

California 2010 Hydrogen Highway Network

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Team Organization and Structure

Mission Statement

The mission of the Public Education Team was to prepare a state-supported marketing, communications and public education plan to make the CA H2 Net successful by the end of the decade, by fostering understanding, acceptance, and support of hydrogen by stakeholders, policymakers, policy influencers, the education community, consumers, and the general public.

The Team's report was crafted with the following at the forefront:

- Incorporating timelines, themes, and messages consistent with the integrated plans of the four other Topic Teams
- Recognizing ongoing public education activities of other public and private organizations, including the U.S. Department of Energy, coordinating with and assisting them where possible and undertaking new initiatives where needed
- Carrying forward the letter and spirit of the CA H2 Net Executive Order's 2010 goals, including:
  - Promotion of consumer understanding of the societal benefits of hydrogen, including safety and environmental aspects of hydrogen use and production
  - Promotion of means to increase the percentage of hydrogen generated from renewable sources
  - Promotion of understanding of the need to establish hydrogen stations for stationary and mobile purposes
  - Support for implementing initiatives designed to place hydrogen-powered vehicles in the hands of consumers and public and private fleets, without creating premature or unrealistic consumer demand
  - Promotion of programs for workforce-development and post-secondary education related to hydrogen, as a means of supporting California's economic growth

Team Structure

The Public Education Team was led by three Co-chairs and a Manager, who guided the development process and ensured cross-fertilization of information to and from the other Topic Teams. The Team organized itself into four working groups based upon the four primary target audience group categories. The working groups reviewed current hydrogen communication efforts, established objectives, identified information needs and key messages, and recommended the best communication strategies.

In addition to the work undertaken by the working groups, the Team's public meeting held on August 12, 2004 was carefully planned to obtain input from individuals representing each of the target audience group categories.

Once the Team's initial research and planning were complete, a smaller Communications Team was organized that included leaders from each of the working groups, the Co-chairs, and the Manager to write the communications plan based upon Team research, working group recommendations, and findings from the public meeting.

Executive Summary

This Topic Team Report presents a detailed outline for translating the Governor's vision — *to make hydrogen fuel available to Californians by the end of the decade, with a significant and growing percentage of the hydrogen produced from clean, renewable sources* – into messages and communications action items directed to specific, key audiences.

It is important to emphasize that, to an uncommon degree for State government initiatives, public education will be a key factor in the success of the CA H2 Net. The CA H2 Net is a call to action, a call to accelerate the transition to a hydrogen economy. For that to happen, the general public must understand the reasons and be supportive, and numerous key audience groups must become actively engaged. Active public education, marketing, and communications outreach will be essential.

Central Message

Cutting across all the audiences in the plan is one common message:

California is becoming a world leader in adopting a hydrogen economy, to address energy, environmental and economic issues that are critically important to the State. The CA H2 Net will:

- *Improve California's environment by reducing emissions that may have an impact on air quality and health*
- *Make California's energy future more secure, stable and sustainable*
- *Improve California's economy and create jobs*

Failure to begin action now will force more costly and difficult action in the future.

Audience Groups

This Topic Team Report is organized around four distinct audience groups. For each audience group, key messages are identified and action steps are proposed. First impressions can be lasting, and it is therefore important to begin early in communicating with all the audience groups to avoid misinformed and negative impressions from taking hold. These groups and the core messages they need to hear are summarized below. Specific action items are not summarized here, but are listed in detail in this Topic Team Report.

A. Technology and Industry Enablers

We need to communicate with companies and industry associations, labor organizations, research institutions, and others who will have an important role in making sure that needed technology advancements and commercial installations are

made. They need to know that hydrogen can mean business opportunities for them, and that California is a prime business location for them. They also need to be motivated – as a way of furthering their business and professional interests — to help us communicate with their peers, their customers, and their communities.

B. Government, Policymakers, and Policy Influencers

Moving hydrogen technologies forward and spurring the installation of hydrogen infrastructure requires State and local policymakers to provide key policy drivers and to mitigate barriers. They need to be motivated by understanding that their actions, if sustained and stable, can make California a world leader in hydrogen, and thereby bring significant rewards to the state: hydrogen will provide job growth and strengthen the State's economy; hydrogen will improve the State's environment; and hydrogen will provide the State a more sustainable and secure energy system. At the same time, they need to be educated in order to understand more about hydrogen — in particular, that its production, delivery, and use will be safe.

C. Consumers, Customers and News Media

For this group — the general public — to be motivated to embrace policies in support of hydrogen, the public needs to understand that hydrogen is consistent with the other "sustainability" policies they support. They need to see that hydrogen is the link among these programs that, in the long term, will provide stable, sustainable energy.

On a consumer level, the general public needs to become familiar and comfortable with hydrogen, understanding that it is as safe or safer than other fuels, and understanding that hydrogen products such as fuel cell vehicles will deliver the performance and utility they expect. The public's consumer expectations must be tempered, however, to not expect too much too soon.

At the local level, early and concentrated communications delivering the messages summarized above is essential with community stakeholders in locations where hydrogen fuel stations are being installed and demonstration projects being implemented. Their comfort, and even pride, in having a hydrogen program in their neighborhood needs to be fostered in order avoid possible opposition stemming from lack of knowledge or fear of hydrogen.

D. Education Community

A sustained program is needed throughout all levels of California's education system to help teachers and administrators fulfill the roles they can play in building the State's hydrogen economy and in realizing the opportunities available to their institutions. Basic concepts relating to energy hydrogen and fuel cells need to be incorporated into curriculum guidelines at all educational levels within the State.

K-12 schools and teachers play a key role in preparing the future professionals and consumers who will make the transition to a hydrogen economy. Educators at this level need, and are eager to receive, hydrogen-related training, curriculum guidance, and

classroom materials. In addition, California's educational content standards must be adapted to incorporate hydrogen education at the K-12 level.

Community colleges can also play a vital role in workforce development efforts by incorporating hydrogen and sustainable technology, education into the Economic and Workforce Development Program; by creating new degrees and certificate programs, through career training programs for emergency responders, technicians, and others who will need hydrogen training; and by developing bridging programs between high school and community college academic programs to fully prepare students for their university education.

California's colleges, universities, and research institutions can expand their international leadership in energy, hydrogen, and fuel cell research; expand their role in training world-class engineers, scientists, business leaders, and policymakers in these fields; and, by their very presence and reputation, can help attract hydrogen business to the state.

Key Cross-Cutting Recommendations

While this Topic Team Report presents many action items for each of the audience groups, some recommendations cut across all the audiences. Key among these cross-cutting recommendations are:

A. High Level Status of Communications Function

CA H2 Net communications strategies and resources must be directed and coordinated from a high-level post. Public information officers from numerous State agencies will play important roles; however, oversight, direction, and coordination must be centralized at a senior policy-making level in order for this multi-pronged communications program to be successful.

B. Single Point of Contact

For each key audience group, a single point of contact must be visible and accessible as the first place that group can turn to for hydrogen information.

C. Major Public Education Campaign

From the beginning, the State needs to organize a public-private advertising campaign to build public understanding of the importance and value of moving towards a hydrogen economy. Lack of public understanding is currently significant and will be a hindrance to public and political acceptance if not addressed. Precedents for this type of campaign include the Department of Food and Agriculture's *Buy California Grown* and the State's recycling campaign, *It's Good for the Bottle, It's Good for the Can.*

D. Early Communications with Communities Where Fuel Stations are Planned is Crucial

If they don't know about hydrogen, local stakeholders can become hurdles rather than champions in building the stations that will become the CA H2 Net. As soon as planning begins for individual fuel stations, educational outreach (and, where appropriate, technical training programs) needs to be undertaken for the communities' first responders and other safety officials, local politicians, neighborhood organizations, and local news media.

E. Leverage with Other Communications Programs

The action items presented in this Topic Team Report are intended to be a blueprint for what needs to be done, without necessarily specifying who should do it. It is intended that the State provide guidance and resources where possible, but that collaborative communications efforts be undertaken with other entities, such as the California Fuel Cell Partnership, the California Stationary Fuel Cell Collaborative, Calstart, the State Fire Marshal's Office, the National Hydrogen Association, the California Hydrogen Business Council, colleges and universities, and companies engaged in hydrogen development. In addition, outreach activities should be conducted as much as possible with joint participation by industry, government, non-government organization (NGO), and academic participants in order to demonstrate the depth of support and momentum for a hydrogen economy.

F. Don't Sell Too Much Too Soon

The program must walk a fine line between educating and motivating, on the one hand, and premature marketing, on the other. A valuable lesson from other alternative fuel programs is that unrealistic public expectations can create frustrated consumer demand, and can stifle needed public and political support for "incubation" programs.

G. Show the Linkage Between Hydrogen, Renewables, and Other Sustainable Energy Programs

In California, policymakers and the public strongly support a broad array of "sustainability" initiatives and products, including energy efficiency, renewable energy, reduction of CO_2, hybrid electric vehicles, and other clean transportation. We must show clearly that hydrogen is not only consistent with all of these, but is a key link that in the long term will provide stable, sustainable energy.

Plan Organization

This Topic Team Report outlines communications requirements necessary to support four market phases that were provided to the Topic Teams as guidance:

- Phase I: The State of Hydrogen in California to Date
- Phase II: 2005 – 2010

- Phase III: Sustainable Transportation is Achieved, 2010 +
- Phase IV: Implementation of a Hydrogen Economy

Phases I and II were the focal points of this plan, because social, political, economic, and other market conditions could be more accurately assessed — and because they provide the foundation for communication strategies.

Phase I is described in Section 1, the *Status Quo* section, which discusses each target audience group's role in a hydrogen economy, their current level of hydrogen exposure and understanding, and information needs.

Phase II is developed in Sections 2 through 8:

- *Overarching Goals (Section 2)* are established to guide all communications activities
- *Core Messages and Communications Processes (Section 3)* are identified to outline the various trigger points that will resonate with each of the target audience groups, and structural and process concepts critical in carrying out public education activities
- *Target Audience Group Challenges and Opportunities (Section 4)* are developed to show the potential supporting role that each target audience group may provide, and communications barriers that limit capacity for their role to be fully realized
- *Technology and Industry Enablers Goals and Recommendations (Section 5)* provide detailed communications activities for sectors playing a role in enabling hydrogen technology or the industry
- *Government, Policymakers and Policy Influencers Goals and Recommendations (Section 6)* outline communications activities for policymakers, permit and safety officials, and environmental organizations
- *Consumers and Customers Goals and Recommendations (Section 7)* give detailed communications activities for the general public, news media, fleets, and potential neighborhoods where hydrogen fuel stations will be sited
- *Education Community Goals and Recommendations (Section 8)* provide detailed communications activities for California educational structures

Phases III and IV are addressed in Section 9, *Phases III and IV Summary*.

Phase I:
The State of Hydrogen in California to Date

1. Status Quo

1.1 Technology and Industry Enablers

California's innovative strength, coupled with unique environmental and energy drivers that demand a rapid move toward sustainable energy, create a scenario conducive to hydrogen infrastructure and technology advancement. The ability of innovators and manufacturers to produce viable hydrogen infrastructure and fuel cell products for early adopters is imperative to the success of a hydrogen economy. After the same time, however, these innovators and manufacturers require the assistance of several groups that will enable them to deliver the products.

Significant financial, human, engineering, and marketing resources are being allocated by automobile manufacturers and energy and technology companies, as well as other entitles including federal, state, and local agencies and organization; the California Fuel Cell Partnership; the California Stationary Fuel Cell Collaborative; the California Hydrogen Business Council; the National Hydrogen Association; and U.S. Fuel Cell Council; and others that collaboratively promote and demonstrate hydrogen technology.

All of the enabler groups generally require credible information in four main areas: (1) the level and longevity of supportive government policies, including policies that foster hydrogen R&D and commercialization; (2) technology breakthroughs and advancements; (3) codes and standards; and (4) public demand for hydrogen products.

California has a tremendous resource of intellectual property in its research institutions. This resource is spread through the academic, governmental, and industrial sectors. From an academic perspective, California contains some world-class institutions, including many of the University of California (U.C.) campuses, Stanford University, and the California Institute of Technology (Caltech). In governmental circles, three of the U.S. Department of Energy laboratories are managed by the University of California, and produce world-class research results in energy and environmental fields. These are Lawrence Livermore National Laboratory, Lawrence Berkeley National Laboratory, and Los Alamos National Laboratory. In addition to the U.C.-managed laboratories, California also hosts two NASA laboratories, the Jet Propulsion Laboratory and Ames Research Center, as well as Sandia National Laboratories in Livermore. Finally, California has served as the springboard for the nurturing and development of many of our nation's critical industries. California is a center of the nation's aerospace industry. Silicon Valley technological firms have led the revolution in information, monitoring, and communications technology. And, California is the center of recent breakthrough activities in biotechnology. These sectors, coupled together, can provide the leadership in the critical, new technological arena of hydrogen, and will help foster political support and capital investment by disseminating information on hydrogen technological progress and viability.

Municipal utilities and investor owned utilities (IOUs) in California are still determining their role in a hydrogen economy. Utilities could play a large role not only because they may be among the first adopters, but also because they have the capacity to promote hydrogen and fuel cell technologies to their customers. Much of their information currently comes from the California Public Utilities Commission (CPUC), the California Energy Commission (CEC), industry trade organizations, energy research institutes, fuel cell and hydrogen infrastructure manufacturers, automakers, the California Fuel Cell Partnership (CaFCP), and other collaboratives.

Builders, architects, and engineers play an important role in the utilization and promotion of hydrogen technology. Although they are generally unaware of the availability, safety, and benefits of hydrogen and fuel cell technologies, they are beginning to receive small amounts of information through trade journals, expositions, conferences, and manufacturers' efforts.

Financial analysts enable the industry to expand by promoting venture-capital investment. However, there is currently very little interest because return on investment is perceived as insufficient.

In the insurance industry, rates are prohibitively high for fuel cell and hydrogen vehicle refueling technologies, due in part to the lack of experience and available data on safety and risk issues surrounding these technologies, as well as a perceived lack of demand in the near future.

1.2 Government, Policymakers and Influencers

California has long been at the forefront of environmental technology and policy, thanks to visionary leadership over several decades from the Governor's Office and State Legislature to the city council level.

California policymakers have become accustomed to advancing clean technologies, and local, regional, and State agencies have developed impressive expertise in environmental challenges and approaches to address them. Every Legislative session addresses literally dozens of energy and environmental proposals. A number of these initiatives can support acceleration of a clean hydrogen economy, including:

- Renewable portfolio standards
- Zero-emission vehicle program
- Greenhouse gas standards for passenger cars
- Energy diversity and reduced petroleum dependence
- Progressive purchasing policies
- Electricity and petroleum conservation initiatives (*Flex Your Power and Flex Your Power at the Pump*)
- Financial and non-financial incentives for clean vehicles (including HOV lane access, VLF reductions, purchase incentives for zero-emission and clean-fuel vehicles, free and preferred parking options at the local level)

- Funding for alternative fuel refueling stations
- Education and outreach

Regional government organizations, including air districts, transportation agencies and metropolitan planning organizations, play important roles in the State's transportation policy. A few of these organizations have been active in supporting and developing hydrogen technologies, including the South Coast Air Quality Management District and AC Transit. However, significantly more outreach will need to be done to educate and engage these important agencies. Many local governments in California have also been very progressive in establishing environmental and energy policies, ranging from clean fleet vehicle requirements and green buildings to renewable electricity purchases. In addition, many of these proactive local governments overlap with areas expected to have the earliest penetrations of hydrogen vehicles.

Because of California's history of leadership in environmental issues, the environmental nonprofit community is very active in the State. Hundreds of environmental, health and consumer organizations work daily to influence policymakers in the State. With broad, popular support across much of the electorate, as evidenced by polling and opinion research, as well as the electorate's history of supporting the environment at the ballot box, California policymakers must be convinced of the environmental benefits of hydrogen technologies before taking on a leadership role in advancing the CA H2 Net.

While some industry groups are often at odds with the environmental community in energy and environmental policy, the advancement of hydrogen could and should see unprecedented cooperation and collaboration in the move towards a clean and secure energy future for California.

However, as a result of often being at the forefront of advanced vehicle technologies, California also has experienced disappointing efforts to accelerate alternative technologies. Without a clear demonstration of consumer demand, a reasonable expectation of profit, and consistent state policies supporting new technologies, history has shown that manufacturers will abandon technologies regardless of significant investment. As a result, policymakers can also be skeptical of new technologies. While a learning curve is expected — with failures and successes — industry must demonstrate a long-term commitment to hydrogen technologies to ensure supportive State policies. Concurrently, State and local policies must reflect a stable, long-term approach to support commercialization of hydrogen technologies.

Despite this long-term view, we must realize the urgency of starting immediately to facilitate understanding of the need to put in place policies and programs to support the transition from fossil fuels to hydrogen. Diversifying our energy sources – particularly in the transportation sector – is a challenging undertaking. Without supportive government policies, however, the effort most certainly will fail or take much longer. We must realize that the cost of doing nothing is great.

While a fair amount of information on hydrogen is being provided to policymakers today, there remain many unanswered questions, and general knowledge of hydrogen technology is limited.

Policymakers generally seek input from a number of sources when considering approaches to energy and environmental policies, including the State's major industries such as agriculture, manufacturing, and high-technology businesses and industry organizations; organized labor; environmental groups; health professionals; local businesses; and community-based groups. The State Legislature also seeks input from the branches of government most likely to be affected by or involved in implementing new policies.

At both the state and local levels, policymakers are generally motivated by the following key objectives: leadership; economic and societal benefit; need; history of success in advanced technologies; and support for local companies, including start-up ventures. Policies encouraging the advancement of hydrogen can meet all of these objectives.

1.3 Consumers and Customers

Progress has been made to create awareness and understanding among the public of the general concept and value of a hydrogen economy, according to several publicly available opinion surveys. However, those surveys also indicate that a greater level of awareness and understanding must be achieved to help ensure that consumers accept and demand that hydrogen technologies be placed in their communities — whether it is the purchase/lease of hydrogen-powered or fuel cell vehicles and/or refueling infrastructure deployment in their backyards.

Along those lines, government, industry, academia, the NGO community, and related interest groups have engaged in activities — some collaboratively like the California Fuel Cell Partnership (CaFCP) — designed to create public acceptance, support and ultimately, the demand for viable hydrogen technologies. Those engaged in developing viable hydrogen economies and technologies are at a critical juncture – it is crucial that key technology milestones be achieved and recognized in order to keep the public interested in the ongoing pursuit of advanced hydrogen technologies, and the incredible promise they have to meet the important environmental and energy challenges and issues that face California, our nation, and the world.

Although significant financial, human, engineering, and marketing resources have been allocated by industry, government, and others to promote and demonstrate milestones in hydrogen and fuel cell technologies, some consumers and customers today still perceive the technology as being too far off in the future for them to get overly excited about. On the other hand, others have unrealistic near-term expectations of when hydrogen technologies will be affordable and available to the mass market.

And while people generally support the concept of transitioning to a hydrogen economy as an important strategy to reduce — if not ultimately eliminate — our dependence on foreign oil and fossil fuel, and in general create energy security for our nation, issues surrounding the current challenges we face in terms of infrastructure development, cost, safety, and the environmental impacts of producing hydrogen make the concept more complex and less accessible.

This scenario is exacerbated by previous experiences of fleet and commercial communities with other alternative fuel technologies. Citing issues that generally surround infrastructure development, fleet customers involved with compressed natural gas (CNG)-powered vehicles, for example, say they are very wary of becoming early adopters of any new advanced technology. These issues include the lack of mainstream marketing initiatives and industry commitment to long-term production, and fluctuating regulatory drivers. In other words, despite significant expenditures and capital investment on fleet purchases and required support infrastructure, "what is here today may be gone tomorrow." Advocates of hydrogen technology must address this cynicism and demonstrate a credible commitment to long-term production and support.

Furthermore, all of these challenges in developing a viable hydrogen economy and hydrogen and fuel cell technologies are being reflected in coverage by the news media. A recent article published by the *Los Angeles Times*, for example, reads, in part, "some experts predict that fuel cell cars won't be ready for inexpensive mass production for decades, if ever." Other coverage has called into question the environmental impacts of generating hydrogen required for fuel-cell technologies. It seems that the tremendous game-changing potential hydrogen has for addressing our environmental and energy concerns, and the legitimate progress being made by industry in that regard, is being clouded in coverage that focuses solely on the tall hurdles that remain. This is a typical cycle that historically all new game-changing technologies have encountered — anything that displaces what we are used to gets increasingly scrutinized over time.

As noted by the U.S. Department of Energy (U.S. DOE) in its draft technical plan for hydrogen education efforts, although “world events have drawn new attention to national energy security issues, there is little consensus about the severity of today’s environmental problems or linkages to fuel choice. With little awareness, understanding or recognition of these issues, there is little impetus for change, and target audience groups are less inclined to embrace new technology.”

Personal experience significantly improves understanding and comfort with new technologies such as hydrogen-powered vehicles. To date, relatively small, but growing, numbers of hydrogen and fuel cell vehicle demonstrations have been or are underway in California, Washington, DC, and other key markets nationally and globally.

Recently announced U.S. DOE demonstration projects will significantly expand the number of hydrogen vehicles and infrastructure development demonstrations across the country. And California’s aggressive CA H2 Net initiative will also facilitate and illustrate real progress in the march by industry, government, and others to create a viable hydrogen economy and market for hydrogen vehicles.

Toward that end, most existing industry and government communications efforts are designed to provide education on the long-term benefits and near-term realities and opportunities of hydrogen, fuel cell technologies, and related infrastructure. Public education efforts are also trying to portray an accurate picture of hydrogen safety issues, and balance the challenges of environmental impacts of near-term hydrogen fuel generation as California and the nation moves toward increasing levels of

renewable production. Every person must understand, where appropriate, his or her part in facilitating the transition to a hydrogen economy.

Environmental justice concerns will be important to address in a manner which ensures that local residents and their local community organizations don't perceive their neighborhoods as being unfairly targeted for hydrogen fuel station placement. Communications efforts in communities will be critical in helping their populations welcome new hydrogen technologies, and understand their role in helping to create jobs and reduce local emissions.

As hydrogen demonstration fleets grow in number and transition beyond pilot projects and placements of hydrogen-powered products and services, industry will naturally dedicate increased marketing and retail resources that will be required to ultimately build and fulfill market demand for products and services. Government can enhance these efforts by providing appropriate incentives to encourage early adoption of these technologies, and help reduce costs of required research and development until mass markets emerge and natural market forces can work to generate both compelling and affordable hydrogen fuel cell technologies that deliver multiple benefits to society.

1.4 Education Community

California's academic institutions have a tremendous opportunity to support an emerging hydrogen economy by providing intellectual resources to advance technology, preparing the workforce, training first responders, and educating both today's and tomorrow's consumers. For these reasons, educational systems are critical to technology transition and social change.

The federal government, state agencies, and public, private, and other organizations have instituted a variety of hydrogen-related outreach programs geared towards the education community. However, policy, economic, and social barriers exist that limit the capacity to fully utilize academic resources.

In K-12, state educational standards determine classroom content, and there is little room to inform students beyond what is required. Community colleges have started to incorporate hydrogen-related education and training into some of their programs, but lack the funding and direction that a State-sponsored top-down hydrogen initiative would provide. Instead, programs are largely determined by what communities are demanding to be taught.

California's university system plays a key role in research and education that will enable a hydrogen economy, and major hydrogen and fuel cell initiatives have been established in universities throughout the State and beyond. To continue to build this tremendous intellectual resource, however, research programs must expand to better address the significant technological, economic, and political challenges that remain.

A more expanded discussion of the education community, including background, existing programs, and policy considerations, is presented in Appendix A of this Topic Team Report.

Phase II:
2005 — 2010

2. Overarching Goals

Marketing, communications, and public education recommendations are geared towards helping to accomplish the following goals, which are consistent with the goals and timelines specified in the overall blueprint plan.

A. State's Reputation

The State of California will be recognized as a worldwide leader in hydrogen technology development and use, and as a credible source of information on the hydrogen economy.

B. Consumer Demand

Demand for hydrogen technologies will be strong enough, as products approach market availability, to pull products to market and ensure that all manufacturers see an opportunity to profit by meeting market needs.

C. Widespread Understanding and Support

A majority of Californians will understand that hydrogen will be produced and used safely, and will deliver economic, environmental, and other societal benefits to the State. They will understand that hydrogen is consistent with, and a central element of, the State's movement towards a diverse array of renewable and sustainable energy systems.

D. Policy Support

At the state, regional, and local levels, California will have in place policies that support an aggressive move towards a hydrogen economy, including incentives for hydrogen production and distribution, as well as development, manufacturing, and purchase of hydrogen vehicles and stationary fuel cells. Government will lead by example in acquiring hydrogen-fueled technologies.

E. Trained Workforce

California will ensure the creation of the best-trained workforce in the nation to support the development of a hydrogen economy.

3. Core Messages and Communications Processes

3.1 Core Messages

Mobilizing the political and economic resources necessary to "*build*" the Hydrogen Highway requires the persuasive use of customized messages aimed at specific categories of key stakeholder audiences, starting immediately and continuing throughout the life of the initiative. Moreover, distinct messages that will have increasing importance as we move down the path will be necessary to make the CA H2 Net a *consumer success* with public users and customers.

Nevertheless, a core unifying message applies to all audiences throughout all stages of the process. This simple, core message needs to be conveyed explicitly or implicitly in all communications activities.

3.1.1 Core Unifying Message

California is becoming a world leader in adopting a hydrogen economy, to address energy, environmental and economic issues that are critically important to the State. The CA H2 Net will:

- *Improve California's environment by reducing emissions that may have an impact on air quality and health*
- *Make California's energy future more secure, stable and sustainable*
- *Improve California's economy and create jobs*

Failure to begin action now will force more costly and difficult action in the future.

The key stakeholder audiences are divided into four broad categories. While there is some degree of overlap in the groups' core messages, the means of delivering the messages and the detailed message points will vary from one audience category to another.

3.1.2 Core Messages for Audience Categories

A. Technology and Industry Enablers

Hydrogen creates business opportunities — Development of the hydrogen economy creates opportunities for industries. In addition to the energy and automobile companies, these would include the buildings industry, utilities, agriculture, insurance companies, and research organizations. Moreover, research organizations would gain increased opportunities for collaborative projects and funding.

California is a prime hydrogen business location — The State is a premier location for companies and investors involved in hydrogen technology and projects.

Industry participants need to be communicators — Companies that are developing or demonstrating hydrogen or fuel cell systems and products can train their employees to be communications ambassadors in their communities.

B. Government, Policymakers, and Influencers

Economic benefits from hydrogen — Investment in accelerating California's movement towards a sustainable hydrogen economy can lead to reduced energy costs over time and a growing economic base of skilled jobs in advanced energy and transportation technologies.

Societal benefits from hydrogen — Increased use of hydrogen in place of more traditional fuels can offer energy-stability, public-health, and other environmental benefits.

Hydrogen is as safe or safer than other fuels — Appropriate mechanisms are being developed and implemented to ensure the safe production, distribution, and use of hydrogen in both mobile and stationary applications.

Stable policies needed — In order for business and investors to take the necessary steps in developing hydrogen-related investments, they must perceive that government policies will be stable and long-term.

C. Consumers and Customers

Hydrogen is as safe or safer than other fuels — Using hydrogen to power a vehicle as well as producing and storing hydrogen in a neighborhood fuel station is at least as safe, and in some ways safer, than using and storing today's conventional fuels.

Hydrogen vehicles will deliver performance and utility — Hydrogen has the potential to deliver an alternative to petroleum-based transportation technologies that can deliver vehicles with comparable performance and utility.

Hydrogen vehicles will be available first to mass transit agencies and fleet operators, and then more gradually to individual consumers — The public deserves to be excited, needs to be supportive, and also needs to be patient.

Hydrogen leads to sustainable energy — Development of hydrogen systems is consistent with, and part of the movement towards, renewable and other sustainable energy strategies.

Economic benefits from hydrogen — Investment in accelerating California's movement towards a sustainable hydrogen economy can lead to reduced energy costs over time and a growing economic base of skilled jobs in advanced energy and transportation technologies.

D. Education Community

K-12 preparing the foundation — Teachers have a key role in preparing the future's professionals and consumers, who will make the transition to a sustainable hydrogen economy.

Community colleges' workforce and technical training — The State's community colleges have critically important opportunities to expand the workforce development and technical training that is essential for the development and implementation of hydrogen systems.

Colleges and Universities as centers of excellence — The State's colleges and universities can expand their capacity as centers of excellence in energy, hydrogen, and fuel cell research, as well as their capacity as developers of top-rate professionals in hydrogen-related disciplines.

3.2 Communications Structure and Process

Summarized below are structural and process concepts that cut across the audience groups addressed in this team report.

A. High Level Status of Communications Function

More so than with most government initiatives, successful implementation of the CA H2 Net and successful movement towards a hydrogen economy requires understanding, acceptance, and action by an extraordinarily broad array of public and private stakeholders, and the general public.

To name a few examples: messages about hydrogen-related benefits need to be incorporated with economic development programs; hydrogen and sustainable energy must be woven system-wide into the State's school and education structure; local safety officials and municipal policymakers must receive coordinated statewide information and training; and consumers must receive consistent messages from many sources, whether it's the Governor's Office or their mayor's office, industry sources or NGOs.

For this to occur effectively, it is critically important that communications strategies and resources be directed from a post that has significant stature and credibility. It must reside high in the State government's decision-making structure. Public information officers in many State government agencies will have roles to play, but oversight of the comprehensive marketing, communications, and public education efforts must operate centrally from a level that conveys policymaking authority.

B. Single Point of Contact

A consistent point that arises from every major audience segment is the need for a credible, one-stop source of information to which they can turn for hydrogen-related information.

Providing each of the major audience categories with a single point of contact is a key recommendation of this Topic Team Report. Whether accomplished through a well-staffed, single Hydrogen Ombudsman's Office or through a network of well-coordinated and well-publicized information offices in several agencies, providing this function will do much to diffuse knowledge about hydrogen and facilitate its acceptance.

At a minimum, the single point of contact for any individual audience group should consist of a well-managed website. In some cases it will require staff support to help work through complex questions and identify other information sources.

C. Major, Galvanizing Public Education Campaign

There is a need from the beginning for the public to understand hydrogen's important role in California's energy and economic future, in order for there to be support for the building blocks it will take to move to a hydrogen economy. Without a fundamental understanding of basic concepts related to energy consumption and the environmental, economic, and health characteristics of California's current energy and transportation systems, the public will not see the need for a change —particularly a costly one.

California's current leadership is clearly not afraid of taking aggressive steps in order to move California where it needs to go, and this presents a golden opportunity for a major public campaign that will prepare the State for a transition to hydrogen, and position California to lead the rest of the world in this transition.

In the beginning years, campaign efforts would need to focus on promoting public understanding and acceptance of hydrogen, the CA H2 Net, and hydrogen vehicles in order to initiate support for policies, and to accelerate the industry. It is not until we move closer to wide commercial availability of hydrogen vehicles that campaign efforts would need to shift more toward consumer marketing to drive demand. And, as this happens, the automobile industry will be instituting its own marketing efforts, and there will be less of a need for a State campaign.

A critical step that should be taken before and during campaign efforts will be to accurately assess Californian's understanding, attitudes, and beliefs about hydrogen through market research, in order that messages and strategies may be tailored to be most effective.

Existing programs that indicate the anticipated scale include *Buy California Grown*, *California — find yourself here*, *Flex Your Power*, and *Flex Your Power at the Pump*. This campaign must include paid media and may require collaboration between public and private funding sources.

D. Early Communications with "Infrastructure Implementers" and "Fuel Station Neighborhoods" is Crucial

Experience has already shown that, in some cases, local resistance, usually born of lack of knowledge about hydrogen, can be a serious and sometimes politically charged hurdle in developing hydrogen fuel infrastructure.

The sources of potential local challenges are many: first responders and other safety officials, permitting officials, local politicians, neighborhood organizations or other active NGOs, and local news media.

A critical component of CA H2 Net communications is to ensure that community stakeholder education programs, covering all important constituencies, are deployed early in locations where hydrogen fuel stations are planned. To a large extent, this function will involve leveraging, and helping coordinate and facilitate, outreach and training programs of the State Fire Marshal's office, community colleges, California Fuel Cell Partnership, and others. A key role of the State program is to make sure that these services are available in a timely fashion and that all needed bases are covered.

E. Coordinate and Leverage with Other Programs and Communicators

Throughout this Topic Team Report, there are numerous recommended actions that already are, or will be, conducted by other government agencies, colleges, public-private consortia, and industry sources (for example: California consumer opinion sampling by California Fuel Cell Partnership).

The intent of this Topic Team Report is *not* to replace or compete with those other organizations' activities, but rather to coordinate with them, help facilitate them, and leverage to mutual benefit. Furthermore, consistent effort should be made to maintain the broad-based involvement among stakeholders that has been achieved through development of the blueprint plan. This will not only sustain momentum, but will help broaden the ability to reach out to additional allies, and build the credibility of the CA H2 Net initiative.

F. Manage Consumer Expectations to Align with Commercial Availability

A valuable lesson learned from other alternative fuel vehicle introduction programs is that public enthusiasm can all too soon create frustrated consumer demand, and can stifle needed public and political support for "incubation" programs.

As stated by the U.S. Department of Energy's education plan, a promotion campaign "launched too far in advance of the consumer market introduction of hydrogen and fuel cell systems may oversell the technology and jeopardize its commercial success. Timed correctly, however, a public education campaign can help overcome knowledge barriers, including safety concerns, and facilitate market success."

The CA H2 Net public education and marketing programs, therefore, must carefully walk a fine line between educating and motivating on one hand, and overselling on the other. This is one reason that a high-level, consolidated office is needed to oversee the public education program and properly time and calibrate the messages.

G. Demonstrate the Linkage Between Hydrogen and Renewable/Sustainable Systems

Significant skepticism exists among some audiences, including some non-governmental organizations and the news media, that hydrogen is really a path to renewable energy or energy efficiency.

To maintain public and political support, CA H2 Net communications programs must keep the linkage between hydrogen and sustainability at the forefront of its messages – with information that is credible and realistic – and work to encourage the State's school system to infuse the sustainable concepts of energy, hydrogen, and fuel cells into education curricula.

In communicating with policymakers and the public, we need to demonstrate that hydrogen is not only consistent with other State sustainability initiatives, but that in many ways hydrogen is the ultimate link between them: energy efficiency, renewable energy development, reduction of CO_2, and clean transportation.

4. Target Audience Group Challenges and Opportunities

Table 1. Challenges and Opportunities by Target Audience Group

Technology and Industry Enablers		
Target Audience	**Opportunities**	**Challenges**
Hydrogen system and fuel cell companies, their suppliers and their demonstration program partners	• Accelerated production and distribution • Can be communications ambassadors to other stakeholders and the public • Leveraging and maximizing resources through partnerships	• Lack of willingness to share information with competitors • Unaccustomed to "telling their story" to other audiences • Lack of training programs to train their own employees for outreach opportunities
Research institutions	• Promote credibility and viability of technologies through greater public awareness of their research and studies • Leverage partnerships for technology transfer / information exchange	• Lack of communication channels for their work to be known publicly
Utilities & independent power producers	• Potential accelerating force for H_2 infrastructure through participation in energy station projects and political influence • As promoters and first-adopters of fuel cell systems, they can promote market development • Capacity to promote awareness and knowledge about H_2 to their customers	• Some are unaware or unsure of their opportunities in the H_2 economy • Stationary fuel cell power may be viewed as market competition • IOUs are uncertain about authorization for spending ratepayer funds to develop and promote H_2 and fuel cell technologies
Building and development industry	• Can stimulate clients to seek a competitive edge with innovative uses of energy in building designs (e.g., energy stations)	• Lack of awareness of fuel cell and H_2 related design and construction literature and practices can stifle progress
Professional, labor & trade organizations in fields related to, or that can benefit from, hydrogen, fuel cells and renewable energy	• Can be messengers of H_2 and fuel cell information, and related business/job opportunities to their members	• Lack of awareness by organizations, other than those directly involved
Insurance industry	• Can stimulate the transition to hydrogen by providing affordable insurance for H_2 infrastructure and vehicles	• Lack of data and experience to quantify risk

Technology and Industry Enablers		
Target Audience	**Opportunities**	**Challenges**
Agriculture sector	• Potential user of H_2 energy systems in their operations • Potential source of H_2 • Utilization of hydrogen technology will help illustrate reliability, safety, and viability to early adopters, help build additional markets, and encourage hydrogen production and refueling infrastructure development	• Lack of communication channels to them on hydrogen • Benefits perceived to be remote – must be convinced that new technology is worthwhile. Lack of market-based incentives can work against acceptance of hydrogen technology
Auto industry	• Public / private collaboration can enhance promotion of hydrogen technology and thereby help build markets and accelerate commercialization	• Historical differences in regulatory approaches can make it difficult to collaboratively focus on shared vision of promoting advanced technology vehicles in a viable hydrogen economy
Oil companies and energy providers	• State leadership in promoting hydrogen production – especially via renewable methods – will help crack the "chicken or the egg" conundrum and will help illustrate long-term viability of hydrogen technology • Mainstream oil company and energy provider participation establishes credibility for hydrogen	• Legitimate business cases must exist to encourage pursuit of hydrogen production and distribution. Without a foreseeable return on investment, oil and energy sectors are less likely to pursue hydrogen technology – renewable or otherwise
Financial analysts	• Attracting investment will accelerate R&D, deployment and cost-reduction	• ROI is perceived as insufficient • Incentives perceived as inadequate or transitory

Government, Policymakers and Influencers		
Target Audience	**Opportunities**	**Challenges**
City & county policymakers	• Local governments can serve as leaders in demonstrating both fueling facilities and use of hydrogen in vehicles and stationary applications	• High initial cost means that local leaders must clearly communicate benefits to local economy as well as societal benefits
Permit officials	• Well-informed permit officials can help deliver expedited fueling installations at lowest cost	• High turnover among inspectors and limited demand for hydrogen installations will require frequent retraining
Safety officials	• Widespread training can ensure appropriate emergency response and foster a feeling of safety in communities	• Relatively low penetration of hydrogen technologies in early years likely to result in lower interest in training
State agencies	• Clean vehicle policies implemented at this level can increase use of H_2 vehicles in fleets	• Vehicles must meet fleet usage needs, and be competitive in cost
State legislators	• History of leadership in energy and environmental policies increases potential for support for aggressive hydrogen policies	• Policymakers must be prepared to take long-term approach to hydrogen commercialization, with successes and failures along the way
Environmental organizations and other influential NGOs	• Environmental and other NGOs have an opportunity to ensure that California's approach to the commercialization of hydrogen delivers maximum societal benefits	• Many national NGOs are skeptical of hydrogen's societal benefits because of different priorities at the federal level and in other states
Selected federal agencies	• California can be seen as proving ground for demonstrating the potential of hydrogen	• Desires of other states to also be seen as leaders, as well as challenges of nationwide implementation, are likely to force federal agencies to move more slowly and balance interests of other states

Consumers and Customers		
Target Audience	**Opportunities**	**Challenges**
General public	• Creating interest and excitement in hydrogen technology can generate acceptance and demand for products and enabling policy drivers – whether its fuel cell, hydrogen ICE, energy stations – as a viable alternative to status quo	• Unrealistic expectations can lead to cynicism over new technologies when advancements don't track with government and/or industry projections • Failing to create appropriate retail (in addition to fleets) and communications processes to generate, meet and service market demand will lead to poor experiences and work against public acceptance of hydrogen technologies
People in communities where H_2 stations will be sited	• Fostering the feeling of safety and gaining acceptance from these communities will affect local policymaker attitudes, reflect on other communities, and accelerate the process for H_2 station siting	• Lack of awareness of societal benefits, and fear of perceived new danger in neighborhoods
News media	• Third-party editorial coverage can help shape and influence opinions among key audiences concerning the societal benefits of a hydrogen economy • The news media will help deliver state and industry messages concerning technology advancement	• News coverage and editorial opinion pages can generate skepticism over ultimate viability of hydrogen technology and the CA H2 Net if milestones aren't met, and legitimate opposing views aren't addressed
Fleet operators	• Early adoption of hydrogen technology by fleet operators will illustrate to other key audiences that technology is reliable, safe and viable • Fleet operators will serve as important technology enablers via daily use of vehicles powered by fuel cells, hydrogen ICEs, and the use of stationary applications	• Without appropriate financial and/or regulatory drivers to make unproven hydrogen technologies more cost effective, fleet operators are less likely to adopt vehicles and/or energy station technologies • Fleet operators may be skeptical based on previous experience with alternative fuel vehicles
Potential fuel sites & users, including big box retailers	• Successful placement of refueling and energy station sites will help demonstrate how safe, viable and productive hydrogen can be in the local community • Can provide a progressive image for retailers that will attract new customers to their facilities, as well as gain positive attention from the media and local policymakers	• Without sufficient demand for hydrogen, it will be hard to generate need for sites • Local safety concerns (NIMBY) could lead to negative campaigns against the retailer and therefore could discourage placement of hydrogen refueling and energy stations

Education Community		
Target Audience	**Opportunities**	**Challenges**
Education policy overview	• Unifying hydrogen and energy education programs with State strategic policies will create an easier path and allow for more widespread integration	• Intra-organizational linkages not formed • No coordinating body
K-12	• Preparing young minds for their technological future will influence the next generation of consumers, policymakers, educators, and workforce	• Current State education standards limit capacity to adequately teach energy and fuel cell concepts • Curriculum models and approach not formed • Funding strategies not formed
Community colleges	• Utilizing the existing EWDP for workforce development will prepare and assist hydrogen technology evolution	• Need to expand directed mission and funding to incorporate technology change • Workforce development programs need to encompass both mobile and stationary energy technologies • Training program and curriculum decisions based upon public demand to be trained
Colleges & universities	• Accelerate the development of technologies and analytical tools critical to the hydrogen economy • Position the State as a leader in hydrogen technology, attract new business and industry • Develop objective analysis to support the public debate regarding the State's energy resources	• Lack of sufficient, long-term funding to support necessary fundamental research • Lack of research structures that adequately support the unique, interdisciplinary challenges of energy, hydrogen and fuel cell systems

5. Technology and Industry Enablers Goals and Recommendations

5.1 Goals

Communications programs will be instrumental in achieving the following by 2010:

A. Industry Attraction to California

Technology companies involved in the production, distribution, and utilization of hydrogen will increasingly see California as a preferred location for their business and their projects.

B. Market Enabling

Agricultural, engineering, architectural, financial, and other market enabling industries will understand the business opportunities available to them related to hydrogen, and they will actively participate in the acceleration of a hydrogen economy. Stakeholders will maximize and leverage resources through partnerships.

C. Research Organizations

Corporate and institutional research organizations worldwide will recognize the opportunities to partner and collaborate with California research institutions in breakthroughs in hydrogen-based technologies.

D. Learning Environment

Data on and lessons learned in hydrogen safety and operating experiences will be shared among technology companies, laboratories, research organizations, utilities, and power producers, thereby accelerating learning in the entire field.

5.2 Recommendations

Table 2. Technology and Industry Enabler Recommendations

Task	Description	Scenario		
		A	B	C
	Hydrogen System and Fuel Cell Companies, Auto Companies, Their Suppliers and Demonstration Partners			
1	**Ensure widespread dissemination of information on regulatory issues, codes and standards issues, and financial incentive programs among hydrogen suppliers and fuel cell manufacturers**			
	• Promote partnerships and information exchange among public and private stakeholders by hosting quarterly networking forums and information workshops	x	x	x
	• Through relationship-based marketing, promote availability of online information source to this audience with updates on regulatory issues and financial incentives, and links to information on local permitting, codes and standards	x	x	x
	• Provide a single point of contact for credible and accurate information about codes and standards, regulatory issues and financial incentive programs	x	x	x
2	**Increase awareness about successful demonstration projects, technology breakthroughs, challenges and lessons-learned**			
	• Host regional networking forums inclusive of all public, private and community stakeholders	x	x	x
	• Through relationship-based marketing, promote availability of online information source with updates on demonstration projects, breakthroughs, and lessons learned	x	x	x
	• Present annual, high-profile Governor's awards for innovation and technological breakthroughs	x	x	x
3	**Encourage and support broad-based internal training at fueling station sites**			
	• Support hydrogen infrastructure training programs and the development of educational material templates to be used for outreach to company personnel	x	x	x
	Research Institutions			
1	**Promote and facilitate partnerships between California's research institutions and corporate / institutional research organizations around the world**			
	• Place articles in trade publications highlighting the work being done in California	x	x	x
	• Coordinate briefings with State chapters of university organizations	x	x	x

Task	Description	Scenario		
		A	B	C
	• Make presentations at research scientist gatherings on California's political and financial support for, and technological progress of, hydrogen energy systems	x	x	x
	• Promote work of California-based institutions through State economic development programs	x	x	x
	• Ensure close collaboration between the State's research institutions and State agencies in advancing hydrogen technologies	x	x	x
	Utilities and Power Producers			
1	**Foster interest in and participation by utilities and power producers in a hydrogen economy**			
	• Support CPUC authorization for appropriate utility funding of hydrogen related activities by providing them with accurate and current information regarding technology development and State policy	x	x	x
	• Place articles in widely read trade publications highlighting the opportunities to participate in the development of a hydrogen economy	x	x	x
	• Municipal utilities and independent power producers – keep the CMUA and CAIPP associations apprised of hydrogen-related opportunities	x	x	x
	Building and Development Industry			
1	**Create awareness about the potential business opportunities related to fuel cell and hydrogen energy systems and the building industry's role in the hydrogen economy**			
	• Arrange for presentations at meetings and conferences attended by building contractors, developers, engineers, architects and building trades unions	x	x	x
	• Place articles in popular publications, such as *Architectural Record* and *Environmental Design and Construction*, highlighting the opportunities for distributed power generation, synergies between systems available in hydrogen technologies, increased options for LEED certification, and lifecycle cost analysis data	x	x	x
	• Seek to create apprenticeship programs for electrical, mechanical and civil engineers		x	x

Task	Description	Scenario		
		A	B	C
	Professional, Labor and Trade Organizations			
1	**Support appropriate professional associations, labor unions and industry trade associations in understanding hydrogen-related opportunities and establishing career development programs**			
	• Identify organizations whose members will benefit professionally as a hydrogen economy progresses, but which are not yet significantly involved or informed	x	x	x
	• Seek to place articles in popular publications and deliver presentations at conferences and workshops	x	x	x
	• Work with the organizations to create apprenticeship and intern programs	x	x	x
	Insurance Providers			
1	**Create awareness among insurance underwriters on hydrogen and fuel cell related business opportunities and ensure access to credible data necessary in making informed business choices**			
	• Identify most likely insurance underwriters for hydrogen systems, such as those that currently insure propane infrastructure. Conduct regular personal briefings		x	x
	• Support the creation of a joint task force to work with insurance underwriters and State Insurance Commissioner on defining data and information needs necessary to provide affordable insurance		x	x
	• Distribute an information packet that may include: the new risks/exposures related to hydrogen infrastructure; the differences between this product and others they are already familiar with, such as propane infrastructure; and safety and training procedures that will eliminate risk		x	x
	• Seek to place articles highlighting hydrogen powered vehicles in trade publications widely read by automobile insurance representatives in California, such as *IBA West, National Underwriter*, and *American Agent and Broker*		x	x
	• Conduct outreach and deliver presentations at insurance association meetings		x	x
	• Support the development of a tracking system of accident and loss history of early demonstration and pre-commercial hydrogen vehicles and deliver the data to potential insurers	x	x	x

Task	Description	Scenario		
		A	B	C
	Financial Analysts			
1	**Promote the economic opportunities of investing in hydrogen and fuel cell systems and foster understanding of the range of financial incentives**			
	• Seek to place articles highlighting successful hydrogen investments in trade publications widely read by financial analysts	x	x	x
	• Create an alliance with CalPERS to promote hydrogen related investments	x	x	x
	Agriculture			
1	**Create awareness of business opportunities and financial benefits related to hydrogen production and use**			
	• Work with State agricultural institutions to inform the agricultural community on potential opportunities for using hydrogen systems and potential for supplying hydrogen from crops and/or biowaste	x	x	x

6. Government, Policymakers, and Influencers Goals and Recommendations

6.1 Goals

Communications programs will be instrumental in achieving the following by 2010:

A. State Support

Policies will be in place to accelerate commercialization of hydrogen vehicle and stationary technologies, and that attract innovative companies involved in the production, distribution, and utilization of clean hydrogen to locate and hire within California.

The State vehicle fleet will include increasing numbers of clean, hydrogen-powered vehicles, and increasing numbers of energy stations will be put into service for power generation at State-owned or operated facilities.

B. Local and Regional Support

Local policies will be in place for hydrogen safety standards, building codes, emergency response procedures, and permitting. Training for key local officials will be in place, and there will be a high level of awareness about hydrogen among these officials so they can support hydrogen infrastructure development.

Air quality management districts, and other local and regional environmental and transportation agencies, will actively support hydrogen fueling installations and vehicle deployment. Regional planning organizations will accommodate and support the advancement of hydrogen transportation systems.

Local fleets, including transit agencies, will include increasing numbers of clean, hydrogen-powered vehicles and increasing numbers of energy stations will be put into service for power generation at local and regional government facilities.

C. Non-Government Organization (NGO) Support

Influential NGOs (environmental and others) will acknowledge hydrogen as an important contributor to this country's clean energy future, and will actively support the development of policies needed for hydrogen's commercialization.

6.2 Recommendations

Table 3. Government, Policymaker, and Influencers Recommendations

Task	Description	Scenario		
		A	B	C
	State Policymakers			
1	**Inform key State policymakers about the benefits and challenges associated with accelerating the commercialization of hydrogen technologies**			
	• Identify highest priority State policymakers, based upon the following criteria: - **Legislators**: Committee/leadership roles, hydrogen-related activity in legislative district, and personal interest in hydrogen technologies - **Agency officials**: Areas of responsibility, e.g., vehicle/energy procurement, safety/emergency response, codes and standards, transportation energy policy, workforce development	x	x	x
	• Conduct personal briefings for targeted policymakers at least twice a year, including vehicle loans and test-drive opportunities	x	x	x
	• Engage state officials in hydrogen activities, including grand openings, vehicle introductions, and industry conferences and events	x	x	x
	• Provide single point of contact for credible and accurate information about hydrogen technologies and the CA H2 Net	x	x	x
2	**Promote model/sample policies for consideration by key policymakers, including policies to address safety codes and standards, provide necessary financial and non-financial incentives and ensure maximum feasible societal benefits**	x	x	x
	• Policies will include interim milestones and recognize the role of enabling technologies	x	x	x
3	**Encourage and support legislative and agency leadership to conduct informational hearings / workshops at least annually to highlight progress**	x	x	x
4	**Promote expansion of State hydrogen vehicle fleet and stationary energy sources**			
	• Sponsor vehicle demonstration events and loan programs to expand familiarity with hydrogen vehicle technologies	x	x	x
	• Establish purchasing policies that encourage increased acquisitions of hydrogen technologies	x	x	x

Task	Description	Scenario		
		A	B	C
	• Work with fleet administrators to identify appropriate high-profile placements for hydrogen vehicles	x	x	x
	• Conduct briefings and site visits for State building management officials at facilities employing stationary hydrogen energy production	x	x	x
	• Highlight State use of hydrogen vehicles and stationary energy applications in employee outreach	x	x	x
	Local and Regional Policymakers			
1	**Ensure basic awareness of hydrogen safety codes and standards development and training needs and opportunities**			
	• Work with organizations such as California Assn. of Fire Chiefs, local chapters of the International Council of Building Officials, League of California Cities, and California State Assn. of Counties to identify opportunities such as newsletters, Web sites and meetings/conferences that could promote a basic understanding of hydrogen technologies	x	x	x
	• Provide briefings, including site visits, to local and regional government boards, commissions and committees having jurisdiction over emergency response and building safety	x	x	x
	• Provide single point of contact for credible and accurate information about hydrogen technologies and the CA H2 Net	x	x	x
	• Ensure that training is provided at least twice annually in light of personnel turnover and rapid technology advancement		x	x
2	**Support development and promote availability of hydrogen safety and training materials**			
	• Work with State Fire Marshal, Community Colleges and other safety training experts, in conjunction with organizations such as the California Fuel Cell Partnership and the National Hydrogen Association, to develop effective materials to support training for emergency responders, permit and inspection officials and others as needed	x	x	x
	• Take advantage of multimedia technologies to provide for PC and Web-based training materials to enhance training	x	x	x
	• Conduct outreach to city and county officials in communities identified as early centers of hydrogen technology applications to encourage training requirements for emergency responders, permit and inspection officials and others as needed		x	x
	• Ensure that materials promoting hydrogen training are highly visible in locations that safety personnel frequent		x	x

Task	Description	Scenario		
		A	B	C
3	**Ensure general awareness of the state of hydrogen technology, potential benefits and commercialization strategy**			
	• Conduct in-person briefings for key policymakers in communities identified as early centers of hydrogen technology applications	x	x	x
	• Invite key policymakers and local and regional officials to visit fueling station construction sites and participate in grand opening events	x	x	x
	• Arrange for presentations on hydrogen technologies, public opinion surveys demonstrating support for hydrogen, and policy needs to advance hydrogen commercialization at meetings/conferences of local government organizations in California, including League of California Cities, Calif. State Assn. of Counties, local Clean Cities programs, California Transit Association and California Air Pollution Control Officers Association	x	x	x
	• Seek to place articles highlighting local government leadership and promoting opportunities to support hydrogen technology commercialization in publications widely read by local government officials, such as *California Journal* and *Transit California*	x	x	x
	• Consider establishing annual recognition/award for local government leadership on hydrogen		x	x
4	**Promote model/sample policies for consideration by key local and regional policymakers, including policies to address safety codes and standards, provide necessary financial and non-financial incentives to expand market for hydrogen technologies and encourage development and expansion of hydrogen-related industries**			
	• Include sample policies to require growing numbers of hydrogen-powered vehicles and stationary energy applications in local government fleets and facilities	x	x	x
	• Sponsor vehicle demonstration events and loan programs to expand familiarity with hydrogen vehicle technologies	x	x	x
5	**Promote expansion of local hydrogen vehicle fleet and stationary energy sources**			
	• Sponsor vehicle demonstration events and loan programs to expand familiarity with hydrogen vehicle technologies	x	x	x
	• Establish purchasing policies that encourage increased acquisitions of hydrogen technologies	x	x	x
	• Work with fleet administrators to identify appropriate high-profile placements for hydrogen vehicles	x	x	x

Task	Description	Scenario		
		A	B	C
	• Conduct briefings and site visits for local government building management officials at nearby facilities employing stationary hydrogen energy production	x	x	x
	• Highlight local use of hydrogen vehicles and stationary energy applications in employee outreach	x	x	x
	• Encourage local and regional governments to take advantage of existing funding, such as AB 2076 subvention funds, to develop hydrogen fueling and vehicle fleets	x	x	x
	Influencers			
1	**Seek broad public support for policies to advance commercialization of hydrogen technologies**			
	• Engage key environmental organizations in analyzing environmental implications of California policies to advance hydrogen commercialization, including peer review of State analysis	x	x	x
	• Conduct briefings for key State and national environmental leaders at least twice a year, including vehicle demonstrations and test drives	x	x	x
	• Seek support from key environmental and industry leaders in advance of adopting or seeking adoption of new State policies to promote hydrogen technologies	x	x	x
	• Conduct briefings at least annually for foundations that fund NGOs involved in energy and environmental advocacy and outreach	x	x	x
	• Identify community-based organizations in areas where fueling stations are planned for installation, and conduct meetings and other outreach to educate CBOs about safety protections, societal benefits and testimonials about experience to date with hydrogen fueling stations	x	x	x
	• Ensure regular communications and information sharing with consumer and safety organizations and auto user groups, including vehicle demonstrations	x	x	x
	• Ensure regular communications and information sharing with industry organizations and trade groups, including CCEEB, California Environmental Dialog, California Manufacturing and Technology Assn. and Silicon Valley Manufacturing Group	x	x	x
	• Provide single point of contact for credible and accurate information about hydrogen technologies and the CA H2 Net	x	x	x

7. Consumers and Customers Goals and Recommendations

7.1 Goals

Communications programs will be instrumental in achieving the following by 2010:

A. Understanding

Consumers and customers will understand the general concept and value of a hydrogen economy, and have an accurate picture of hydrogen safety issues. The public will understand how they can help facilitate the transition to a hydrogen economy, and they will recognize the near-term realities and opportunities of hydrogen and fuel cell technologies.

B. Visibility and Demonstrations

Hydrogen technology demonstrations occurring in California's largest metropolitan areas will have high, positive visibility, and will create realistic expectations for commercial availability of hydrogen vehicles and/or stationary applications.

C. Demand

Cities and counties will be motivated to seek opportunities to increase hydrogen fuel sites in their regions. There will be sustained growth in early-adopter consumer demand for hydrogen-powered vehicles and stationary applications.

7.2 Recommendations

Table 4. Consumers and Customers Recommendations

Task	Description	Scenario		
		A	B	C
	General Public			
1	**Assess public perceptions and understanding of hydrogen economy and hydrogen and fuel cell technologies**			
	• Establish baseline of public perceptions of hydrogen and fuel cell systems	x	x	x
	• Conduct periodic reassessments of public perceptions through 2010	x	x	x
	• Collaborate measurement with annual CaFCP, PPIC, U.S. surveys and/or work by other academic institutions or key organizations – leverage measurement/assessment activities conducted by U.S. DOE	x	x	x
2	**Develop institutional paid media campaign, and major State public education campaign like the Department of Food and Agriculture's *Buy California Grown*, designed to ensure that Californians embrace the general concept and value of a hydrogen economy, and support the CA H2 Net. This campaign must be carefully designed to avoid generating unrealistic or premature consumer expectations.**			
	• Campaign messages should be based upon findings from the assessment of public perceptions about hydrogen, and re-calibrated as perceptions change	x	x	x
	• Develop a theme and common "look & feel" to help establish brand equity among general public for the CA H2 Net	x	x	x
	• Print, electronic, Internet, outdoor advertising, and direct mail	x	x	x
3	**Establish a CA H2 Net Public Tour**			
	• Integrate CA H2 Net messages, promotional materials, and/or establish on-site display presence at major consumer events with items like an interactive kiosk, fuel cell demonstration vehicles, and/or other appropriate properties that could be supplied by CaFCP member companies/organizations at: – County fairs – Auto shows – Environmental fairs – Community days – Educational opportunities – CaFCP events/public tours – Auto museums – Towe, Petersen – Technology forums	x	x	

Task	Description	Scenario		
		A	B	C
4	**Develop a grass roots outreach activity targeting neighborhood associations, local influencers and other community groups during the very early stages of fuel-station placement to help address concerns and encourage acceptance**			
	• Use lessons learned to avoid potential localized controversy that could delay and/or derail hydrogen fueling station creation and placement	x	x	x
	• Help explain why “my backyard” would be a good place for a hydrogen fueling station	x	x	x
	• Demonstrate that neighborhoods are not being unfairly targeted and that hydrogen technologies can help create jobs and reduce emissions in local communities	x	x	x
5	**Establish a CA H2 Net Speakers Bureau**			
	• Develop a generic speaker presentation kit in a box	x	x	x
	• Target local civic organizations, business groups, community meetings, Town Hall gatherings, environmental organizational meetings	x	x	x
	• Engage Hollywood celebrities/influencers to serve as spokespeople for PSA campaigns and/or participate in special demonstration activities	x	x	x
6	**Provide information about location of hydrogen fueling stations to early consumers while expanding awareness of availability of hydrogen products to the public at large**			
	• Work with CalTrans to develop and install directional signs for hydrogen fueling locations	x	x	x
	• Work with industry to ensure that refueling locations are readily identifiable via onboard telematics technologies, such as OnStar	x	x	x
	News Media			
1	**Establish earned media activities to create a broad understanding of and support for the CA H2 Net Executive Order’s 2010 goals among consumer / customer audiences**			
	• News media relations campaign to reach key influential news media and opinion leaders – those that drive coverage by others	x	x	x
	• Newsworthy CA H2 Net milestones & events	x	x	x
	• Regular deskside briefings and editorial board visits with stakeholders representing the balanced support for hydrogen – auto industry, energy companies, environmental organizations, government, etc.	x	x	x
	• Op-ed article placement	x	x	x

Task	Description	Scenario		
		A	B	C
2	**Assign/recruit a high level marketing and communications executive dedicated solely to the CA H2 Net to reside in a post that has significant stature, credibility and capability to work with the Governor's Office. The executive would:**			
	• Be responsible for daily communications activities and strategic planning	x	x	x
	• Manage the media and outreach campaign	x	x	x
	• Align and incorporate CA H2 Net themes and messages into appropriate State activities and agencies	x	x	x
	• Ensure that the collaborative process with stakeholders and joint participation is maintained	x	x	x
	• Oversee the CA H2 Net "news bureau"	x	x	x
	• Ensure a steady drumbeat of relevant CA H2 Net news	x	x	x
	• Identify and provide spokesperson training materials to major CA H2 Net spokespeople & ambassadors	x	x	x
	• Develop press materials & media Web site – Overview press kit – Create common "look and feel" – build brand equity – General backgrounder releases covering each of the five topic areas – Fact sheets – Milestones – Executive Order/Announcement Speech – Key contacts and resource list – Develop key messages and Q&A's that are continuously updated	x	x	x
	• Develop major CA H2 Net theme that resonates with target audience groups	x	x	x
	• Create and maintain a CA H2 Net crisis communications plan that anticipates potential accidents and negative consequences on public perception. The crisis plan will outline appropriate actions and messages required to address as many calamities as can be anticipated/identified	x	x	x
3	**Establish CA H2 Net news bureau to generate steady drumbeat of news. Examples could include:**			

Task	Description	Scenario		
		A	B	C
	• Significant CA H2 Net milestones and technology advancements • Release of first Blueprint Plan & biannual updates • Refueling station announcements/openings/photo ops • Fuel cell vehicle demonstrations – CaFCP, DOE • Refueling infrastructure demonstrations and advancements • Accomplishments of the California Stationary Fuel Cell Collaborative • Reports, demonstration projects	x	x	x
4	**Ensure accurate and balanced messages to the public about the CA H2 Net**			
	• Conduct regular monitoring of news media coverage, including qualitative analysis of how key messages are being portrayed in the news media	x	x	x
	• Revise key messages based on coverage analysis and to react to unanticipated hydrogen-related technology issues	x	x	x
	Fleet Operators			
1	**Direct elements of paid and earned media campaigns at publications and events critical to shaping opinions of fleet customers, and support industry efforts to promote hydrogen technologies among this audience**			
	• Create awareness of incentives to facilitate early adoption of hydrogen technology	x	x	x

8. Education Community Goals and Recommendations

8.1 Goals

Communications programs will be instrumental in achieving the following by 2010:

A. Next Generation: K-12

Students in California will have scientific understanding of energy, hydrogen, and fuel cell concepts that will prepare them for their technological and energy future.

B. Workforce Development

Community colleges, State colleges, and State universities will have implemented undergraduate and graduate learning programs so effective that scientists, engineers, technicians, business leaders, and policymakers trained in California will be some of the best in the world in hydrogen-related subjects.

C. Research

University-based research organizations within the State will have implemented programs ensuring that California will lead the country in hydrogen-related research and development.

8.2 Recommendations

Table 5. Education Recommendations

Task	Description	Scenario		
		A	B	C
	Note: EHFC = Energy, Hydrogen and Fuel Cell Concepts			
	General Education Policy			
1	**Maximize the contribution of California's educational institutions, programs and resources to attainment of a hydrogen economy**			
	• Establish a high level Hydrogen Education Liaison in the Governor's Office or CalEPA to work with the Superintendent of Education, Department of Education and other policymakers to oversee implementation of all education recommendations in this report	x	x	x
2	**Align hydrogen with other education policies that move the State towards renewable energy technologies and sustainable development**			
	• Create hydrogen education initiatives within the broader context of a *Sustainable Energy Education Initiative,* including current and expanded energy and resource efficiency educational efforts	x	x	x
3	**Foster continual flow of hydrogen content in the education system**			
	• Provide a single credible online resource for teachers and program administrators so they may be easily directed to grant opportunities, classroom tools, curricula, on-site learning opportunities, programs, guest speaker candidates and other activities that will provide knowledge about EHFC concepts	x	x	x
	• Investigate opportunities to work with educational media (e.g., Discovery Channel, Channel One Network) to develop educational media for use inside and outside the classroom	x	x	x
	• Seek ways to include hydrogen education with larger demonstration projects involving public-private partnerships that include funding support from State sources	x	x	x
	• Convene educational summits for educators and program administrators at K-12, community college and university levels to plan for widespread incorporation of EHFC concepts into the State's education system	x	x	x
4	**Secure adequate funding resources to expand existing energy and advanced technology education programs to include hydrogen, and to develop new ones**			
	• Coordinate the development of new State grants and program funding	x	x	x