

CALIFORNIA
STATIONARY FUEL CELL COLLABORATIVE

Roadmap to an Updated Strategic Plan

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FINAL REPORT

September 2005

Executive Summary

The California Stationary Fuel Cell Collaborative (CaSFCC) was established on June 9, 2001 to accelerate the deployment of stationary fuel cell technology in California. The Collaborative adopted a Strategic Plan in March 2002 to address issues facing fuel cells, such as high capital costs of fuel cell product, the undemonstrated durability and reliability of fuel cell technology, and the regulatory and policy hurdles associated with distributed generation (DG).

Over the past four years, several events have occurred including a bulk purchase bid for fuel cells by the California Power Authority (CPA), the preparation of a siting and procurement initiative by the California Department of General Services (DGS), the launching of several demonstration projects in California, changes in policy by the California Public Utilities Commission (CPUC) to its Self Generation Investment Program and exit fee requirements, the establishment of the California Coalition of Fuel Cell Manufacturers, and the adoption of three incentive programs for which fuel cells are eligible. On April 20, 2004, Governor Schwarzenegger signed Executive Order S-7-04 creating a Hydrogen Highway Network Initiative specifically naming the Collaborative as a key participant.

In evaluating the specific next steps for the CaSFCC, both government and industry representatives have recommended that the current Strategic Plan be revised. New areas of emphasis include the development of sound and supportive policy for DG, support for well-designed demonstrations, procurement of fuel cell systems by the State of California, improved and expanded incentive programs, and identification of technology barriers and implementation hurdles that impact cost reduction, commercialization, and deployment of fuel cell systems.

Developments in the energy sector and tendencies that are shaping the economic structures underscore the importance of developing and expeditiously implementing a Strategic Plan that fully considers the barriers as well as the opportunities associated with this dynamic energy environment. In the "Energy Action Plan"* approved by the California Energy Commission, the CPUC and the CPA, it is recommended that the State promote and encourage clean and renewable customer and utility owned distributed generation as a key component of its energy system. In addition, the California Hydrogen Highway Network Blueprint plan is currently under development. This plan identifies hydrogen and hydrogen-based high-tech emerging industries as holding great promise to address three of California's top priorities: energy security, environmental protection, and economic development.

Fuel cells have the potential to improve the economic and environmental health of the State of California. They offer substantial benefits including reducing or eliminating air pollutants and greenhouse gas emissions, increasing energy efficiency, promoting energy reliability and security, promoting energy diversity, and helping to realize a sustainable energy future. Fuel cells are particularly well suited for the emerging DG market due to their low acoustic signature, high quality waste heat, potential for high reliability, and low emissions. However, the early market for deployment is challenged by high capital costs of fuel cell product, the undemonstrated durability and reliability of fuel cell technology, and the regulatory and policy hurdles associated with DG.

* Energy Action Plan, California Energy Commission, April 30, 2003, Sacramento, CA.

This document presents a roadmap (Roadmap) to the development of a revised Strategic Plan and outlines an approach to address issues that are key to the Collaborative goal of commercializing stationary fuel cells for power generation in California. Accordingly, it includes a discussion of strategic issues that should be addressed as well as tasks that should be undertaken. This roadmap does not address a priority nor a weighting of importance to specific tasks but includes a process to engage interested stakeholders in establishing: (1) the specific objectives of each task, (2) the relative importance of each task, and (3) the timelines for achieving the objectives of each task. The following eight tasks are proposed:

Task 1 – Formalize Collaborative Structure

Task 2 – Identify and Address Technology Hurdles

Task 3 – Establish and Implement Systemic Demonstration Plan

Task 4 – Establish and Implement Large Scale Deployment Projects

Task 5 – Support the Hydrogen Highway Network Initiative

Task 6 – Identify, Address, and Implement Policy, Regulations, Legislation, and Incentives

Task 7 – Conduct Key DG Economic and LCA Studies

Task 8 – Develop and Implement an Outreach/Marketing Program

The development of these tasks will form the basis for the revised Strategic Plan, which will identify paths by which the timeframe for volume fuel cell penetration may be shortened.

A proposed organizational structure and budget are also contained in this Roadmap, which are based on the Collaborative needs to accomplish identified tasks. The organizational structure of the Collaborative is unique and innovative. The governance is anchored in a Core Group that encompasses government entities at the State, Federal, and regional levels. This structure allows the important strategic issues associated with policy, regulation, and legislative action to be addressed in the most efficient manner possible and allows key networking and open communications among government entities as they explore and address their multiple roles in advancing the fuel cell future.

It is proposed that this current structure be maintained with one important addition. As all CaSFCC members recognize that fuel cell commercialization and deployment require and are dependent upon industry involvement, industry participation, advice, and counsel must be a cornerstone of Collaborative operations. While the original charter called for an informal advisory committee, this Roadmap provides for more formalized input from industry representatives.

A proposed budget for calendar year 2005 is included. Income is based on a proposed level for membership fees and also assumes income from other sources, such as State-funded programs, foundations, and other organizations. With regard to expenses, categories such as special studies and outreach should be considered as placeholders.

Preface

Deployment of stationary fuel cells for power generation offers the State of California many benefits. The early market, however, is challenged by high capital costs and both regulatory and policy hurdles associated with distributed generation (DG). The California Stationary Fuel Cell Collaborative (CaSFCC) was created to address these challenges and hurdles, and to facilitate commercialization.

The Collaborative's initial Strategic Plan was formulated in March 2002. This Roadmap outlines the need for revisions to the initial Strategic Plan based on prior accomplishments and changes that have occurred in California over the past two years. Accordingly, it includes a discussion of strategic issues that should be addressed as well as tasks that should be undertaken. Success will require input from CaSFCC members including government agencies, non-government organizations, industry, and the general public.

Succinct Background.

The California Stationary Fuel Cell Collaborative (CaSFCC) is a key initiative of the Air Resources Board (ARB) and the National Fuel Cell Research Center (NFCRC). It was established in 2001 by senior executives of the State of California and the NFCRC to advance stationary fuel cell commercialization. The CaSFCC focuses on the development and support of early markets for stationary fuel cells. This focus is integral to a range of technology initiatives taken by the ARB to meet environmental and energy goals of the State.

The organizational structure of the Collaborative is unique and innovative. The operating core and governance are anchored in government entities at the State, Federal, and regional levels. This structure allows the key strategic issues associated with policy, regulation, and legislative action to be addressed in the most efficient manner possible and allows key networking and open communications among government entities as they explore and address their multiple roles in advancing the fuel cell future.

All CaSFCC members recognize that fuel cell commercialization and deployment require and are dependent upon industry involvement. As a result, industry participation, advice, and counsel are a cornerstone of Collaborative operations. The original charter established an informal advisory committee for industry input on key decisions, strategic issues, and activities.

The Collaborative began with an emphasis on procurement and subsequently broadened its scope to include policy and regulations that affect fuel cell market entry in distributed generation (DG). The benefits of fuel cells (efficiency, low emissions, quiet) have led to significant Federal R & D funding and State incentives. However, incentives alone have not been able to establish a DG fuel cell market. The high capital cost of these systems, the undemonstrated durability and reliability of fuel cell technology, and the absence of enabling public policy remain major barriers for market penetration. The Collaborative scope directly addresses these significant barriers to DG market penetration of fuel cells by:

- *Establishing an open forum and process for implementation of initiatives and incentives.*
- *Supporting fuel cell development and demonstration activities.*
- *Identifying fuel cell commercialization needs.*
- *Addressing needed changes in policy and regulation.*

The CaSFCC has generated considerable interest from private industry members, as well as Governor Schwarzenegger. In April 2004, CaSFCC was cited as a key participant in the Governor's Executive Order S-7-04 for the California hydrogen highway initiative to develop the State Hydrogen Highway Network blueprint. At the October 2004 CaSFCC industry meeting, industry and government representatives strongly encouraged and endorsed an update of the Strategic Plan and the formalization of the Collaborative structure.

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1.0 Overview

Fuel cells have the potential to improve the economic and environmental health of the State of California. They offer substantial benefits including reducing or eliminating air pollutants and greenhouse gas emissions, increasing energy efficiency, promoting energy reliability and security, promoting energy diversity, and helping to realize a sustainable energy future. Fuel cells are particularly well suited for the emerging DG market due to their low acoustic signature, high quality waste heat, potential for high reliability, and low emissions. However, the early market for deployment is challenged by high capital costs of fuel cell product, the undemonstrated durability and reliability of fuel cell technology, and the regulatory and policy hurdles associated with DG.

The California Stationary Fuel Cell Collaborative (CaSFCC) was established on June 9, 2001 to address these challenges and thereby enable the market and accelerate the deployment of stationary fuel cell technology.¹ Notable among the significant events that have occurred over the ensuing four years are:

Bulk Purchase Bid. A bulk purchase bid was prepared by the CaSFCC and administered through the California Consumer Power and Conservation Financing Authority (the California Power Authority or CPA). Although the CPA bid process did not result in a bulk purchase of fuel cell product and the CPA was subsequently terminated, the process itself was successful in (1) stimulating fuel cell manufacturers to address the realities of deploying commercial product (e.g., manufacturers established realistic production estimates and prices and established strategies for five-year warranties), and (2) creating deployment partnerships with third party energy services companies.²

DGS Siting and Procurement Initiative. In parallel, the Collaborative worked with the California Department of General Services (DGS) to develop a distributed generation siting process for DGS facilities. The DGS also identified host sites for early RFPs issued to bidders deemed eligible by the CPA.²

Demonstration Programs. Key demonstration programs were launched through the South Coast Air Quality Management District (SCAQMD) and the Department of Defense (DoD), and the Demonstration Committee of the Collaborative surveyed manufacturers and end users, and established demonstration protocol to assure market meaningful projects.

Policy Reform. Key policy reform was accomplished through (1) changes in the California Public Utilities Commission (CPUC) Self-Generation Program, (2) input into the CPUC consideration of Exit Fees, and (3) the development of the California Fuel Cell Manufacturers Coalition.

Incentive Programs. Three significant State incentive programs were established for which fuel cells are eligible.³

¹ The original Charter for the Collaborative is presented in Appendix C.

² The California Fuel Cell Manufacturers Coalition has played a very important role in these achievements. Further details are provided in Appendix B.

³ Emerging Renewables (Rebate) Program, Self-Generation Incentive Program and Supplemental Energy Payments (SEPs).

Information Data Bases. (1) An informative CaSFCC web site was launched, (2) fuel cell installations in California were documented, (3) annual fuel cell manufacturer surveys were conducted, (4) economic viability of fuel cell deployment research was launched, (5) Life Cycle Analyses (LCA) for energy efficiency, environment, and the economics associated with fuel cell technology was initiated, and (6) a study of other state and international fuel cell programs was conducted.

In addition to these achievements, particularly remarkable events have occurred in California during the past year that directly impact the existing and future fuel cell markets. For example:

1. The political climate has substantially changed in California.
2. California's reaction to the energy crisis and initial years of deregulation are now settling and the climate for proactive leadership is particularly opportune.
3. Significant deployment of fuel cell systems from kilowatts to a megawatt is emerging in the California market.
4. Governor Schwarzenegger's Executive Order S-7-04 created a Hydrogen Highway Network Initiative and specifically named the Collaborative as a key participant.
5. Applications of fuel cells in the stationary market are creating benefits including reduced urban emissions and fuel consumption, and improvements in health and competitiveness that are not adequately accounted for in the market today. These externalities have not been, and perhaps cannot be captured in implementation schemes using conventional economic analyses. A Life Cycle Analysis approach, developed and sustained by the Collaborative, is recommended.
6. Some states seeking to compete for the manufacturing, employment, and deployment base associated with fuel cells have provided greater regulatory certainty and superior economic, policy, and regulatory incentives.⁴ If California is to benefit in the mid and long term from the manufacturing, employment, and volume deployment of fuel cells, the State must develop equal or superior policies.

As a result of past accomplishments and the recognized potential for future achievements, the Collaborative's Strategic Plan needs to be revised. In evaluating the specific next steps for the CaSFCC, both government and industry representatives have recommended that the updated Strategic Plan emphasize:

- (1) The development of sound and supportive policy for DG,
- (2) Support for well-designed demonstrations,
- (3) Procurement of fuel cell systems by the State of California,
- (4) Improved and expanded incentive programs, and
- (5) Identification of technology barriers and implementation hurdles that impact cost reduction, commercialization, and deployment of fuel cell systems.

To achieve these expectations and shorten the time to commercialization, the Strategic Plan should place a high priority on:

- Establishing a formal structure for the organization and operation of the Collaborative.
- Identifying the current stationary fuel cell technology development targets, timeframes, and the needed R & D support.
- Identifying and facilitating selective demonstration of technology improvements.

⁴ See <http://www.dsireusa.org/library/includes/techno.cfm>

- Identifying and creating application projects – with comprehensive inclusion of external benefits as value components.
- Participating in and supporting the Governor’s Hydrogen Highway Network initiative.
- Identifying policy implications and considerations.
- Evaluating economic and Life Cycle Analyses of stationary fuel cells relative to other technologies.
- Formulating recommendations on the CaSFCC strategy for commercialization.

Based on this background, the following seven tasks are proposed:

Task 1 – Formalize Collaborative Structure

Task 2 – Identify and Address Technology Hurdles

Task 3 – Establish and Implement Systemic Demonstration Plan

Task 4 – Establish and Implement Large Scale Deployment Projects

Task 5 – Support the Hydrogen Highway Network Initiative

Task 6 – Identify, Address, and Implement Policy, Regulations, Legislation, and Incentives

Task 7 – Conduct Key DG Economic and LCA Studies

Task 8 – Develop and Implement an Outreach/Marketing Program

Industry support for this strategy is high. To advance the Collaborative’s effectiveness in implementing the updated Strategic Plan, industry has recommended initiating a membership-based financial support structure.

2.0 Collaborative Structure

2.1 Mission Statement

The following is the currently approved Mission Statement of the California Stationary Fuel Cell Collaborative:⁵

⁵ www.stationaryfuelcells.org

To promote stationary fuel cell development and commercialization as a means towards:

- Reducing or eliminating air pollutants and greenhouse gas emissions.
- Increasing energy efficiency.
- Promoting energy reliability and security.
- Promoting energy diversity.
- Promoting energy independence, and
- Realizing a sustainable energy future.

The Collaborative envisions fuel cell installations pursued by State, local and public organizations as well as private entities. We believe that California represents a critical market for the fuel cell industry. Therefore, it is anticipated that California will capture 5 to 25 percent of the global sales volume capacity over the next several years.

The Collaborative will take **specific actions** to promote a wide variety of fuel cell technologies, sizes, and applications for installation in California. These actions will include facilitating the installation of fuel cells in a variety of applications including: industrial, commercial, residential, premium, remote, backup, and base-load power applications - as the market dictates.

The Collaborative will provide unparalleled leadership in facilitating the installation of fuel cells in State buildings as well as support the installation of fuel cells in other markets.

The Mission Statement is a living document that is regularly reviewed and updated by the Goals Committee.

2.2 Organizational Structure

The organizational structure of the Collaborative is unique and innovative. The governance is anchored in a Core Group that encompasses government entities at the State, Federal, and regional levels. This structure allows the key strategic issues associated with policy, regulation, and legislative action to be addressed in the most efficient manner possible and allows key networking and open communications among government entities as they explore and address their multiple roles in advancing the fuel cell future. Responsibility for the day-to-day governance is entrusted to co-chairs, and the day-to-day operations are implemented by an executive director.

All CaSFCC members recognize that fuel cell commercialization and deployment require and are dependent upon industry involvement. As a result, industry participation, advice, and counsel are a cornerstone of Collaborative operations. While the original charter called for an informal advisory committee, this Roadmap provides for more formalized input from industry representatives as the Industry Advisory Panel.

Executive Director, Co-Chairs

The co-chairs of the Collaborative provide overall policy guidance and direction to the Collaborative. Dr. Alan Lloyd, Agency Secretary of the California Environmental Protection Agency (Cal/EPA), and Dr. Scott Samuelsen, Director of the National Fuel Cell Research Center (NFCRC) serve as co-chairs. Ron Friesen, Air Resources Board (ARB), serves as executive director. At the present time, staff support for the Collaborative consists of one full-time clerical person and communications/outreach support from the NFCRC.

Governance

The ARB provides overall administration of the Collaborative under the direction of the executive director. Administrative duties include maintaining a headquarters office in the Cal/EPA headquarters building in Sacramento, overall management of Collaborative resources, responsibilities for membership relations, and overseeing staff support. The NFCRC provides overall support to the Collaborative with particular focus on communications, outreach, technical support, research, and policy. The ARB and NFCRC conduct an annual manufacturers survey, schedule and conduct meetings of the Core Group and industry, and interact with organizations that sponsor conferences, meetings, and special events related to the commercialization of stationary fuel cells in California.

Core Group

The Core Group provides overall guidance in the implementation of the Collaborative's objectives. Participants of the Collaborative represent governmental entities interested in combining efforts and resources towards commercializing stationary fuel cells in California. As representatives of governmental organizations, the members of the Core Group provide industry with an opportunity to engage with agencies in California responsible for the development of policies, procedures, and regulations as they relate to the development of the Collaborative's mission. The Core Group consists of the following organizations

- California Air Resources Board
- California Department of General Services
- California Department of Transportation
- California Energy Commission
- California Environmental Protection Agency
- California Public Utilities Commission
- California Business Transportation and Housing Agency

- Los Angeles Department of Water and Power
- National Fuel Cell Research Center
- Sacramento Municipal Utility District
- South Coast Air Quality Management District
- United States Department of Defense
- United States Department of Energy
- United States Environmental Protection Agency
- United States Fuel Cell Council

The Core Group established the overall objectives, key actions, and timelines for implementation activities through the Strategic Plan adopted in March 2002. Additional organizations such as the California Department of Finance, the State Fire Marshal's Office, and the Bay Area Air Quality Management District would add value to the Collaborative and will be contacted to join the Core Group.

Committees

As outlined in the Mission Statement, the Collaborative's primary efforts have been to facilitate the commercialization of fuel cells for power generation in stationary applications throughout California. Its focus has been to:

1. Establish inter-organizational policy to utilize fuel cells in government facilities,
2. Identify and addressing regulatory barriers,
3. Engage in fuel cell education and outreach activities to promote stationary fuel cell systems, and
4. Collect, evaluate, and distribute data on the existing and potential use of commercial fuel cells for power generation in California.

Five committees assist in implementing Collaborative activities. The Goals/Policy Committee monitors and sets objectives towards the mission and goals of the Collaborative; the Deployment Committee develops and implements master purchase plans to generate bulk orders as well as sponsors demonstrations of a variety of fuel cell technologies; the Transportation Interface Committee examines the existing and future cross-linkages between stationary and mobile installations, the Technical Committee identifies and addresses cross-cutting technology hurdles currently limiting the penetration of fuel cells into the California market. and identifies and conducts key studies deemed important to establishing the relative merits of fuel cell technology, and the Outreach Committee helps to raise targeted industrial sectors and general public awareness about the benefits and challenges of fuels and fuel cells, and promotes fuel cell commercialization

3.0 Strategic Plan

3.1 Basis

Developments in the energy sector and tendencies that are shaping the economic structures underscore the importance of developing and expeditiously implementing a Strategic Plan that fully considers the barriers as well as the opportunities associated with this dynamic energy environment.

Economic Tendencies

Two important tendencies continue to gain momentum in shaping major sectors of economy --technology availability (rapid developments in information and alternative technologies) and dispersed flexible production (the drive toward lower costs, end-user choices, and reliability, security and independence, often real, sometimes perceived). Within the past two to three decades, key sectors of the economy (automobiles, information, manufacturing, retail, telephones, etc.) have dramatically changed as a result of these tendencies.

Implications on Energy and Fuel Cells

While the energy sector seems to lag behind other sectors in adjusting to technology availability and dispersed flexible production, the two forces exert a strong influence towards more distributed generation, end-user choice, and a greater mix of renewable energy. These tendencies will continue to drive change due to the Governor Schwarzenegger's pro climate change position for California in spite of the formal United States withdrawal from the internationally ratified Kyoto Protocol.

Recent concerns with reliability, the restructuring of the electric power industry, and the energy crisis in California have also contributed to increased interest in DG and its potential to provide opportunities for renewable energy. In its 2003 *Integrated Energy Policy* report,⁶ the California Energy Commission (CEC) conducted numerous technical studies, which examined all aspects of energy supply, production, transportation, delivery and distribution, demand and pricing. The report recommends the Governor, Legislature, and other State agencies implement strategies addressing energy-related issues that harvest energy efficient programs, diversify fossil fuels and fuel sources with alternative fuels and renewable energy, offer consumers energy choices, and strengthen the State's energy infrastructure. According to this report, distributed generation (DG) provides the benefits of improved reliability and power quality, peak-shaving options, security, and efficiency gains through the avoidance of line losses and the use of waste heat for heating and/or air conditioning

Also, in the Energy Action Plan⁷ approved by the California Energy Commission, the California Public Utilities Commission and the California Power Authority, it is recommended that the State promote and encourage clean and renewable customer and utility owned DG as a key component of its energy system. The California Hydrogen Highway Network Blueprint plan, currently under development, identifies hydrogen and the hydrogen-based high-tech emerging industries as holding great promise to address three of California's top priorities: energy security, environmental protection, and economic development. Some technology forecasters believe stationary fuel cells could be the most significant enabling technology in the transition to a hydrogen economy, both from an energy production standpoint and their ability to reduce the cost of developing a hydrogen refueling network. Stationary fuel cells have the potential to become the preferred option for renewable energy supplies.

Energy Landscape

California's energy crisis in 2001 demonstrates the State is vulnerable to shortages, and that such shortages in central power generation, whether real or perceived, can cause a major social and economic disruption. Much of California's existing generating capacity is over 30 years old. Within the past few years, every effort has been made to address this problem through the expedited permitting of new generating facilities, and a successful conservation campaign.

The costs of regulation, the risks in a restructured industry with unstable dominant arbitrageurs (like Enron), instability in the Middle East, and the specter of terrorism have converged as dominant features. The search for a secure and sustainable energy future has become an overarching theme. In response to these and other concerns, the U.S. Department of Energy points out in its strategic plan that the "nation seeks a long-term vision for

⁶ Integrated Energy Policy Report, California Energy Commission, December 2003.

⁷ Energy Action Plan, California Energy Commission, April 30, 2003, Sacramento, CA.

sustainability and security.”⁸ This could result in several initiatives towards alternative sources of energy, maximizing choice through DG, and reduced fossil fuel dependency through efficiency gains and renewable technologies.

An array of new technologies – from hydrogen storage to advanced reformers – appear to be on a fast track to commercial demonstration. Many companies and organizations believe that these ongoing developments are likely to move the energy sector towards the eventual goal of a hydrogen economy.

In the atmosphere of a shared common vision among international, national, state, and regional initiatives, the Collaborative can benefit by more effective communication and coordination with the U.S. Department of Energy, the World Bank, and California initiatives, such as Sustainable Buildings and the Hydrogen Highway. The Collaborative has an immediate leadership opportunity with these emerging State energy and environmental initiatives.

Overarching Environmental Policy Goals

While an overarching view of “Sustainable California” has not been put in place, several programs have been initiated that can lead to this vision. This Roadmap, the Hydrogen Highway Blueprint, Executive Order S-20-04 on Sustainable Building, the Governor’s Action Plan for California’s Environment, the Environmental Goals and Policy Report (EGPR), and others point in this direction. In June of 2004, Governor Schwarzenegger charged then Cal/EPA Secretary Tamminen with developing greenhouse gas emission reduction targets.⁹ If and when this vision is developed, this Strategic Plan should use it as a guiding light a point on the horizon toward which to aim the compass for this plan.

The Governor’s Action Plan for California calls for a statewide cut in air pollution by up to 50 percent and restoring our independence from foreign oil. The EGPR projects that population in California will nearly double to 58 million by the year 2040.¹⁰ To accommodate this increase, pollution from our per capita energy use for stationary power and transportation must decrease dramatically if we are to make any progress on concentrations of pollutants in the ambient air, water, and land. It will ultimately be necessary to reduce emissions to the point where human activity is in equilibrium with planetary cleansing mechanisms, or support of the population will not be possible. With the existence today of technologies that can meet our stationary and mobile energy needs with essentially zero emissions, it is but a small logical step to assume an ever-increasing role for these important technologies.

Summary

These efforts lay the foundation to accelerate the shift toward a near zero-emission, highly distributed energy future. The short-term goals of such initiatives can lead into broader benefits, such as increased consumer choice through technology advancement of both fuel cells and their attendant co-developing alternatives, including incumbent technologies. A summary of

⁸ The Department of Energy Strategic Plan, "Protecting National, Energy, and Economic Security with Advanced Science and Technology and Ensuring Environmental Cleanup", September 30, 2003.

⁹ Letter from Terry Tamminen to Linda Hoffman, Director, Washington State Department of Ecology, dated June 23, 2004.

¹⁰ “Governor’s Environmental Goals and Policy Report,” Office of Planning and Research, Nov 2003, p 13.

the major driving forces that are accelerating the shift towards these new technologies, including a distributed energy future, are the:

- Continuing trend toward ever-higher population in California.
- Continued preference for clean alternatives primarily based on local pollution, congestion, and climate change considerations.
- Opening of energy markets to DG technologies with attributes attractive to the economic and environmental health of the State (e.g., enhanced efficiency, recovery of waste heat, enhanced reliability to complement grid power, enhanced power quality, prime and/or back-up power, fuel flexibility, a cornerstone of the hydrogen economy).
- Evolution of advanced technologies (such as fuel cell/gas turbine hybrids) that offer the highest known thermal to electric efficiency in any application (distributed or central power).
- Competition for profits in a stagnant, squeezed energy sector that is increasing the divide between technology areas. Technology-oriented companies in the automotive, energy supply and services are poised with a variety of demonstrated technologies in fuel cells, hydrogen generation, and renewable energy generation, which will require mass procurement and key technology advances to reduce costs.
- Response from incumbent technologies to improve performance and lower costs is raising the bar for new and emerging technologies, making commercialization of fuel cell systems even more challenging.
- Increasing demand for security of supply emanating from 9/11 and the Northeast blackout.
- Renewed development of policy frameworks to integrate economic, environmental, and social benefits in attaining (or retaining) technology superiority. It is almost universally accepted that the highest profits and highest growth rates will be to those businesses/regions that can position themselves through advanced technology.
- Opportunities for economic development for the State by creating a regional cluster of fuel cell related research, development, manufacturing, and sales.

3.2 Approach

In evaluating the specific next steps for the CaSFCC, it is important to consider several factors. For example, the Collaborative should address the following questions:

- What actions by the Collaborative are required and can be taken to facilitate the commercialization of stationary fuel cells?
- What are the obstacles to commercialization of stationary fuel cells that must be forcibly addressed by the Collaborative?
- In addition to public policy and regulative forces, what key technology hurdles are limiting the rate of deployment?
- What are the competing technologies to fuel cells, and to what extent can they be embraced to open the market?
- How long will it take to realize significant market penetration with and without Collaborative engagement?

3.3 Tasks

This Roadmap focuses on issues that are key to the Collaborative's goal of commercializing stationary fuel cells for power generation. Accordingly, it includes a discussion of strategic issues that should be addressed as well as tasks that should be undertaken. The tasks are introduced and the implementation strategy is presented. Except for Task 1, the order of the tasks reflects neither a priority nor a weighting of importance. Instead, a roadmap process is proposed that engages interested stakeholders in establishing (1) the specific objectives of each task, (2) the relative importance of each task, and (3) the timelines for achieving the objectives of each task.

Developing Tasks 1 through 8 will enable the Collaborative to advance its mission and goals. The Strategic Plan will lead to cross-linkages of Collaborative activity with other fuel cell and renewable technology initiatives at the State, Federal, and regional levels. Combined with the effort of the CaSFCC, these initiatives will be the foundation from which future regulations and policies can be framed so as to accelerate the benefits to California. Table 1 below identifies the CaSFCC staff and/or CaSFCC Standing Committees that have responsibility for each task, and stipulates the time frame for developing a roadmap for each task. It is expected that each task will include measurable outcomes, timeframes, and a budget for the implementation of the task. Once the tasks are developed, the Industry Advisory Panel (IAP) and the Core Group will prioritize the measurable outcomes within and among the tasks as well as verify the budget to implement each of the eight tasks. Once this process is completed, the tasks will become part of the CaSFCC Strategic Plan.

Table 1
Responsibilities for Development and Implementation of Tasks

Task	Description	CaSFCC Standing Committee	Roadmap Completion Date
1	Formalize CaSFCC	Goals/Policy	February 28, 2005
2	Technology Hurdles	Technology	April 29, 2005
3	Demonstrations	Deployment	June 30, 2005
4	Deployment Projects	Deployment	June 30, 2005
5	Hydrogen Highway	Transportation	April 29, 2005
6	Policy, Regulation	Goals/Policy	April 29, 2005
7	Studies	Technical	May 27, 2005
8	Outreach	Outreach	March 31, 2005

Task 1 – Formalize Collaborative Structure

Identify and recommend a formal structure for the Collaborative; identify and recommend potential financing mechanisms for the administration of the Collaborative; prepare and adopt a budget to implement the goals and mission of the Collaborative.

The structure proposed is contained in Appendix A. It maintains the current co-chair, staff and Core Group positions and functions. The proposed organization of the Collaborative also provides for the creation of an Industry Advisory Panel (IAP) consisting of one representative from each industry member organization. The proposed Organization Chart in Appendix A shows the relationship of the Industry Advisory Panel to the Core Group and executive director and other activities and functions of the CaSFCC. In addition, it is

proposed that the NFCRC at the University of California, Irvine manage the membership fees and the funding from other organizations. An independent fiscal audit will be performed by an outside organization. The executive director will be responsible for preparing the budget and conducting operations within the approved budget. The Core Group will continue to provide policy guidance and direction, and the Industry Advisory Panel will provide guidance on funding, technical activities, and projects. This task will be the responsibility of the Policy and Goals Committee of the Collaborative.

Task 2 – Identify and Address Technology Hurdles

Identify and address cross-cutting technology hurdles currently limiting the penetration of fuel cells into the California market.

Under this task, a data collection of the key cross-cutting technology hurdles that must be addressed in order to free and facilitate the fuel cell market will be performed under the direction of the executive director and the NFCRC. To address these hurdles, results from existing market studies will be used to map fuel cell power generation costs and assess progress over time (actual and projected). Using these results, this task will provide a map of fuel cell costs over time against other electric generation technologies. Included in this assessment will be an identification of cross-cutting technology improvements and paths towards resolution. This will enable the Collaborative to assess the scope and potential for acceleration for timelines as well as identify regulatory and policy hurdles that will be necessary for fuel cells to become competitive in the market. This will also help identify areas to emphasize in terms of research and development or demonstration that will mitigate technology hurdles and complement renewable and petroleum reduction goals. Examples encompass building integration of both the electrical and thermal product from hardware design to controls, absorption chilling, power electronics and inverter technology, and DC distribution and utilization within the built environment. This effort will draw on input from all parties of the Collaborative and others such as research institutions and development organizations that are working to advance fuel cell technology as well as commercialize the technology in different sectors. Armed with this information, the Collaborative can then identify the paths by which to shorten the timeframe for large market penetration. Task 2 will be closely coupled to Tasks 3 and 7 and be the responsibility of the Technical Committee of the Collaborative. Task 2 will be resourced by the California Energy Commission and the membership of the CaSFCC .

Task 3 -- Establish and Implement Systemic Demonstration Plan

Develop a systemic plan with clear objectives and robust strategic alliances for the demonstration of commercial and pre-commercial fuel cell systems (of various types, applications, and sizes).

In parallel with the information developed in Task 2, this task will develop a systemic plan with clear objectives and robust strategic alliances for the demonstration of pre-commercial and commercial fuel cell systems (of various types, applications and sizes). The plan will identify and generate demonstration settings that will complement renewable and petroleum reduction goals, and accelerate the

integration of fuel cells into the built environment. The plan will incorporate public policy financing strategies. Task 3 will engage the CEC, SCAQMD, DGS and the CaSFCC Demonstration Committee with a strong integration and synergy with other major demonstration programs such as the DoD CERL Fuel Cell Demonstration initiative, the DOE/DoD Climate Change Demonstration Program, and the World Bank-International Finance Corporation capital buy down subsidy program. The task should specifically identify how fuel cell systems and their technical and functional requirements can best be configured for California end-use markets, lead to a roadmap for larger fuel cell deployment-based on market demand and pull, and establish the cost and benefit of policy actions to help implement the plan. Task 3 will be the responsibility of the Deployment Committee and be resourced by the Department of General Services and the membership of the Collaborative.

Task 4 – Establish and Implement Large Scale Deployment Projects

Using information obtained through DGS, establish a strategy and implement a program with the DGS for a large-scale procurement, and a matrix of resources from within DGS to proceed with project development.

Using information obtained through DGS and the analyses in Task 2, the Collaborative will establish a strategy and implement a program with DGS for a large-scale procurement, and develop a matrix of resources from within DGS to proceed with project development. The task will differentiate between demonstrations and procurement of commercial products in order to assure an unambiguous government procurement process for fuel cell product. Task 4 will be the responsibility of the Deployment Committee and be resourced by the Department of General Services and the membership of the Collaborative.

Task 5 – Support Hydrogen Highway Network Initiative

Following the engagement of the Collaborative in the activities associated with developing the “blueprint” of Governor Schwarzenegger’s Executive Order (EO) on the “California Hydrogen Highway Network,” this task will focus on supporting the Initiative’s implementation.

Members of the Collaborative were actively engaged in the development of the blueprint plan for a network of hydrogen fueling stations in California. In particular, the co-chairs of the Collaborative served on the Implementation Advisory Panel, and many Collaborative stakeholders provided key leadership and support for the five Topic Teams (Societal Benefits, Economy, Implementation, Rollout Strategy, and Public Education). In addition to general support, Collaborative engagement was sought in describing the role of stationary fuel cells and distributed generation in the hydrogen future, providing definitions for “energy stations,” “hydrogen refueling stations,” and “distributed generation,” and addressing the manner by which DG and stationary fuel cells can both promote and anchor the evolution of a hydrogen economy. This task will focus on the supporting the implementation steps with particular emphasis on:

1. Developing Energy Station Economics and Identifying Sites.
Develop an economic case for energy stations utilizing Life Cycle Analyses (LCA) for both energy and environmental benefits and identify potential sites for development.

2. Developing Economics of DG at Hydrogen Refueling Stations and Identifying Sites. Develop an economic case for adding DG to hydrogen refueling stations utilizing Life Cycle Analyses (LCA) for both energy and environmental benefits and identify potential sites for development.
3. Facilitating the Deployment of Representative Stations. In the initial roll out and construction plan, assist in the deployment of generic Energy Stations, and DG-Powered Hydrogen Refueling Stations.

Task 5 will be resourced by ARB, NFCRC, DGS, SCAQMD and CaFCP, whose representatives will work with the CaSFCC Transportation Interface Committee and Hydrogen Highway personnel.

Task 6 –Identify and Address Policy, Regulations, Legislation, and Incentives

Provide policy analysis and support to State government on regulatory and legislative actions that will further the mission of the Collaborative.

This task pursues and develops policies in State government and the public sector for capital outlay projects consistent with the State’s policy for “Sustainable Buildings,” using State level efforts as models or templates for other public agencies; participating in regulatory proceedings such as the CPUC proceedings related to connectivity and incentive programs; providing informal input to CPUC staff and Commissioners; reviewing ARB’s 2007 DG emissions standards and the efforts of the SCAQMD in considering the ARB 2007 standards as Best Available Control Technology (BACT); and working with the CEC to sustain and expand incentive programs. Other areas appropriate for consideration are the development and adoption of architectural and engineering guidelines for fuel cells and other DG products into DGS policy, the inclusion of fuel cells in the State Action Plan for Green Buildings, and a revision of LEED classification criteria to appropriately value fuel cell integration in the building design¹¹. The Collaborative will also continue to actively participate in the hydrogen highway initiative, and identify potential interconnections with technology developments in the transportation sector. The effort will be approached with the recognition that other states are endeavoring to provide equal or superior policy, regulations, legislation, and incentives in order to gain the manufacturing and employment base represented by a large, emerging new industry such as fuel cells.

This task will be the responsibility of the Policy and Goals Committee and be resourced by the Air Resources Board and the membership of the Collaborative.

Task 7 – Conduct Key DG Economic and LCA Studies

Provide and present data that are particularly enlightening and insightful in describing, quantitatively, the attributes of fuel cell technology in contrast to both existing central power and emerging distributed generation technologies Identify potential negative impacts of the emerging fuel cell market, provide mitigating strategies, and coordinate and collaborate with the fuel cell LCA initiatives of the Environmental Protection Agency.

¹¹ LEED: “Leadership in Energy & Environmental Design” administered by the U.S. Green Building Council (www.usgbc.org)

This task identifies and conducts economic and LCA studies deemed important to establishing the relative merits of fuel cell technology, developing a database for informing the market of economic and environmental benefits of fuel cell technology, and guiding the technology assessments associated with Task 2. The task will be the responsibility of the Technical Committee of the Collaborative and be resourced by the NFCRC and the membership of the Collaborative.

Task 8 – Develop and Implement an Outreach/Marketing Program

Develop a program to raise targeted industrial sectors and general public awareness about the benefits and challenges of fuels and fuel cells, and promote fuel cell commercialization as a way to increase efficiency and reduce or eliminate criteria pollutants and greenhouse gas emissions;
Develop a mechanism for (1) responding to issues concerning stationary fuel cells raised by the media and others, (2) develop service and support jobs within the state, and (3) conduct training sessions for Fire Marshals and other emergency responders.

The development of a program to address and fulfill those aspects of the CaSFCC Mission, Purpose, and Objectives that can or must be met through proactive outreach will be developed under the direction of the NFCRC. The program will establish procedures and protocols to assure that communication between Collaborative and stakeholders is clear, consistent, and unambiguous. Topics that the program will address includes coordinating with working committees, managing communications with the ARB Media Office for media relations, and establishing responsibilities and direction for the CaSFCC web site. The major thrust of Task 8 will be directed to potential end-users and end-user groups, instead of stakeholders. Coordination with the U.S. Fuel Cell Council, the State Hydrogen Highway Network Initiative, and the Department of Energy Hydrogen Infrastructure Initiative will assure that resources are efficiently and effectively utilized. Under this task the CaSFCC will focus its resources on stakeholders and early adopters. As one example of this emphasis, stakeholders have suggested seminars, held at the NFCRC, that bring manufactures and end users together to discuss fuel cell technology applications and integration of these technologies into the building environment. This task will be the responsibility of the Outreach Committee of the Collaborative and be resourced by the membership of the Collaborative.

4.0 Closure

The Roadmap was discussed at the Collaborative on February 3, 2005. The primary purpose of this meeting was to seek input from the membership and to approve the Roadmap.

In the longer term, we see the need to reach out to various stakeholders to provide generic business case scenarios for fuel cells throughout the State. Such business cases will assist in decision making at the local level. We also see the need to assist in facilitating funding, as well as organizing conferences and workshops for municipalities. These activities will all require data gathering and information technology reporting.

It is intended that this document be updated and revised annually given the nature of government procurement contracts, policy changes, and technology development. These immediate tasks will rollover, as completed, into a further delineation of the longer-term tasks to follow.

Appendix A Collaborative Organization and Budget

Introduction

In just four years, the California Stationary Fuel Cell Collaborative (CaSFCC / the Collaborative) has evolved into an organization that has become an important part of the California Air Resources Board's (ARB) activities and an integral component of the Hydrogen Highway Network Initiative launched by Governor Schwarzenegger. To date, the CaSFCC has operated as a volunteer organization with staffing by ARB and complementary staff and funding support from the National Fuel Cell Research Center (NFCRC). To meet new challenges and opportunities, it has been recommended by industry stakeholders that the Collaborative (1) establish a formal organizational structure, (2) establish an operating budget, and (3) seek funding from membership dues, foundation grants, and State and Federal incentive programs.

This Appendix provides a draft budget and recommendations for policies and procedures of the organization. Recommendations have been reviewed by the ARB legal staff, and this document reflects their input.

Background

The California Stationary Fuel Cell Collaborative (CaSFCC) was formed in June of 2001 to advance commercialization of stationary fuel cells. Dr. Alan Lloyd, Cal/EPA Secretary, and Dr. Scott Samuelsen, Director of the National Fuel Cell Research Center serve as co-chairs. The staff consists of Executive Director Ron Friesen, one full-time clerical person, and communications/outreach support from the NFCRC.

In conjunction with CaSFCC's co-chairs, a Core Group of organizations (state, federal, and regional governmental agencies) established the overall objectives for the Collaborative, created four committees, and developed key actions and implementation timelines through a Strategic Plan. Industry and other stakeholders were engaged to address specific technical and policy issues through a series of regularly scheduled "Industry Meetings" and by participation on the standing committees. A web site (www.stationaryfuelcells.org) was established to convey information to stakeholders of the Collaborative, the emerging market, and the general public. The Strategic Plan was commissioned in March 2002. Due to the maturation of the Collaborative, the evolution of the fuel cell technologies and markets, and new opportunities, a Roadmap to a revised Strategic Plan is currently under development.

New Opportunities

Executive Order S-7-04, signed in April 2004 by Governor Schwarzenegger, specifically identified the engagement of the Collaborative in the development of the state's Hydrogen Highway Network. To help the State meet its goals, the Collaborative has provided (and continues to provide) objective guidance regarding deployment of stationary fuel cells. However, the CaSFCC can make a greater contribution to the Initiative and advance its organizational goals by: a) facilitating development of energy stations and/or DG at locations where hydrogen refueling stations will be built, b) pursuing research and development projects

as identified by industry, c) working with agencies on supportive policies and programs, and d) conducting outreach and education to a variety of stakeholders.

Proposed Structure

It is the desire of the CaSFCC members to maintain flexibility in pursuing the Collaborative's mission. Industry members have pointed out that while there is strong endorsement for fuel cells and hydrogen in the transportation sector in California, this is not the case for stationary fuel cell applications. However, there is common agreement that if fuel cells are commercialized in the near term, stationary applications will precede transportation applications.

Currently, the Collaborative structure is informal and does not allow representation or consensus. It has therefore been suggested that the Collaborative could be better structured if there were a fee to support more commitment and action. If a modest fee (e.g. \$10,000 per year) to pay for activities were required, the Collaborative could obtain consensus of the members regarding the pursuit of research and development efforts, adoption of policies and actions by agencies, and provision for more adequate information transfer through public outreach and other related activities. Cal/EPA is committed to this effort and will continue to provide in-kind services as well as financial support to the Collaborative as it now does for the California Fuel Cell Partnership.

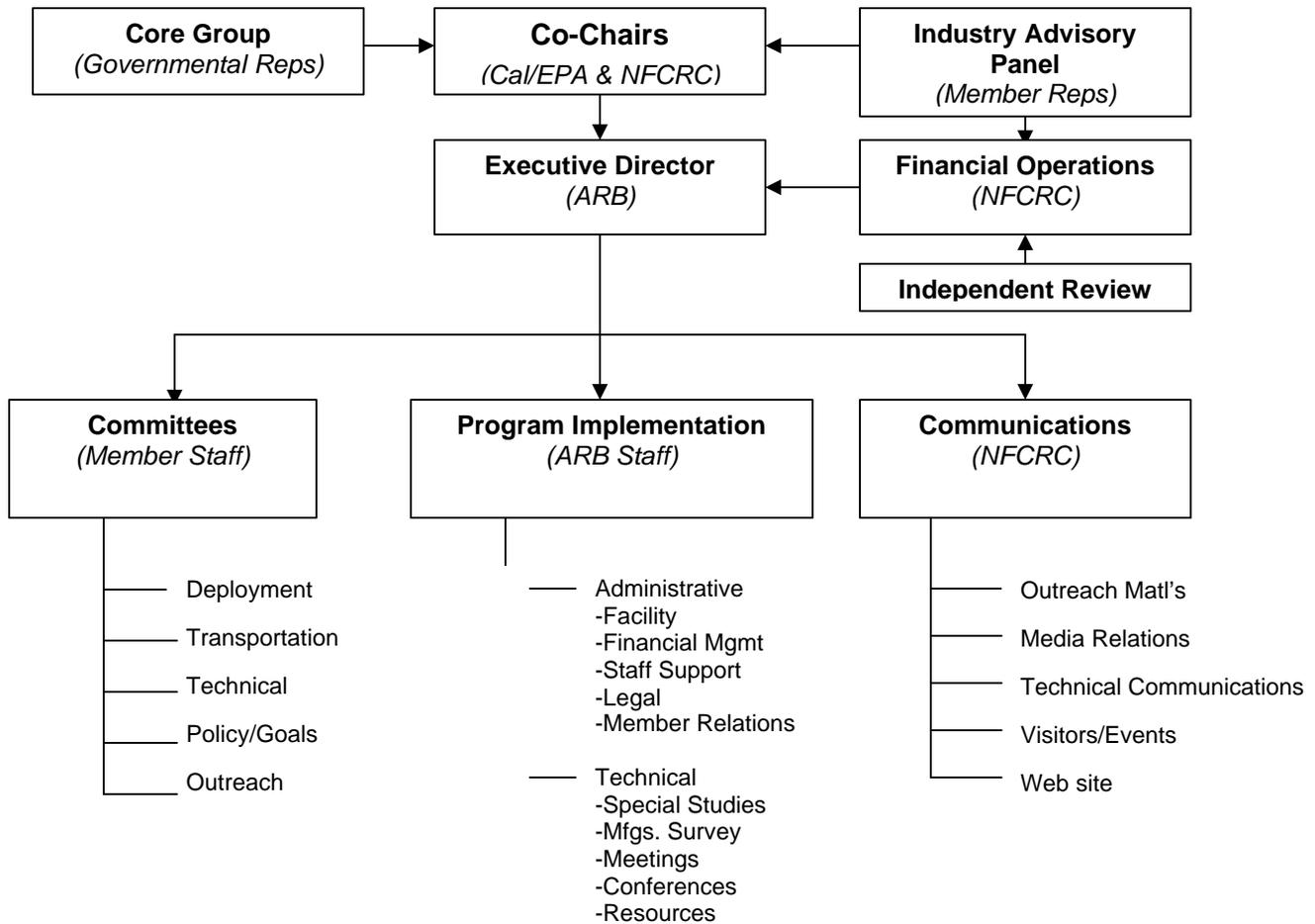
The structure proposed in this Appendix maintains the current co-chair, staff and Core Group positions, committees, and committee functions. The Core Group of the Collaborative is anchored in government entities at the State, Federal, and regional levels. Limiting the governance to governmental entities allows key strategic issues of policy, regulation, and legislative action to be addressed in a cohesive, efficient, and non-commercial manner. Importantly, the governance strategy allows key networking and open communication among the governmental entities as they explore and address the multiple roles of government in advancing the fuel cell future. Participants in the Core Group are expected to provide significant in-kind and budgetary support through, but not limited to, the provision of personnel to resource their Collaborative activity.

Since commercialization and deployment of stationary fuel cells requires and depends upon industry success, input from industry representatives is desired before making key decisions, or developing strategy, regulation or policy recommendations. As a result, this Appendix also proposes a membership structure and a formalized Industry Advisory Panel (IAP) consisting of one representative from each Industry member organization. Industry member organizations would include fuel cell manufacturers, utilities, fuel suppliers, end users, developers, and non-governmental organizations. The Organization Chart on the next page shows the relationship of the Industry Advisory Panel to the existing structure. The Core Group will continue to provide policy guidance and direction; the Industry Advisory Panel will provide guidance on funding, technical activities and projects.

It is recommended that a Budget Committee be formed to assist in the preparation of an annual budget. The Budget Committee would include a representative of the Core Group and the Industry Advisory Panel. The Budget Committee would provide the first level review of the draft budget prepared by the executive director. Once reviewed, the draft budget would be submitted to the entire Industry Advisory Panel whose review and recommendations would be submitted to the Core Group for final approval.

The Collaborative has a Strategic Plan to carry out its desired activities. This Roadmap includes specific actions to promote a wide variety of fuel cell technologies, sizes, and applications for installation in California. These actions include the identification of limiting cross-cutting technologies specific to the California market and facilitating the installation of fuel cells in a variety of applications with a specific emphasis on providing leadership in facilitating the installation of fuel cells in State buildings, hydrogen fueling stations, and other markets. To accomplish the outlined tasks, the CaSFCC plans to establish membership fees and pursue additional financial support from foundations, State agency funding programs (CEC and PUC incentive programs) and Federal grants and programs (DOE and DoD).

PROPOSED ORGANIZATIONAL STRUCTURE



Categories of Membership and Fees

A membership fee is required for each organization participating in the Industry Advisory Panel. Two levels of participation are offered. An annual Director membership, at \$10,000, provides voting rights, allows members to have an influence on policy, the budget and other Collaborative activities, and participation on the Collaborative standing committees. The second level is an Associate Director membership at \$5,000 per year. Associate Directors do not have voting

rights but are able to participate in the meetings, participate on the standing committees, and otherwise have full participation and access to CaSFCC activities and documents. In addition to the membership categories, an Affiliate category is available for \$250 per year. Affiliates will have their association posted on the Collaborative web site, have access to the standing committees as ad-hoc participants, be informed of CaSFCC decisions, and be provided documents that are not deemed confidential.

Membership does not guarantee projects proposed by members would be funded or approved. Member firms and organizations will be credited on the Collaborative web site and provided other outreach materials. Additional member benefits are delineated in the CaSFCC Membership Agreements (see below). Affiliates will also be credited on the Collaborative web site.

Operations of the Collaborative

To ensure the efficient operation of the Collaborative, and understanding by all members and associates, a series of documents will developed by the CaSFCC Core Group upon the advice from the standing committees and the Industry Advisory Panel. They include Operating Protocol, Financial Procedures, Confidentiality Agreements, and Membership Agreements.

CaSFCC Operating Protocol

The Operating Protocol will clarify the organizational structure of the Collaborative and its teams including the relationships between the Core Group, Industry Advisory Panel, committees and executive director. It will specify criteria for membership in the Collaborative and procedures for accepting new members. It will identify responsibilities and procedures, as well as operating protocols for decision-making, meetings, correspondence and communications

CaSFCC Financial Procedures

Each year, the executive director is responsible for preparing annual goals and a draft budget for review and recommendation by the Budget Committee, the Industry Advisory Panel and approval by the Collaborative's Core Group. Upon approval, the budget and the updated Strategic Plan become guideline documents for the operation of the Collaborative in that budget year.

The Financial Procedures document will contain contractual agreements for management services, identification of bank accounts, cash flow, accounting procedures, financial review and financial control systems. It will also identify procedures for deviating from the approved budget.

It is further proposed that the NFCRC manage membership and affiliate fees and funding from other organizations, the executive director be responsible for preparing the budget and conducting approved operations, and a Budget Committee be formed to offer input into the process. An independent fiscal audit will be performed by an outside organization.

CaSFCC Confidentiality Agreement

This document will identify the procedures for handling information that is held by the CaSFCC and is deemed to be confidential by the participant whose information it is.

CaSFCC Membership Agreements

Benefits and financial responsibilities of each member category will be delineated in the CaSFCC Membership Agreements document. All members of the Collaborative will sign agreements delineating their level of membership and membership dues.

Legal Guidance

On October 15, 2005, General Counsel Diane Moritz Johnston provided legal guidance to the Collaborative by responding to questions posed by Executive Director Ron Friesen regarding the proposed structure and operations. The statements below summarize her findings.

Proposed Structure

“There is no question the promotion of such clean-air technologies as fuel cells is within the ARB’s jurisdiction. In addition, there is ample evidence in statute that the Legislature considers the promotion of fuel cell technology and use to be a public purpose. The ARB may pay a membership fee and provide in-kind support without violating the California Constitution’s prohibition on gifts of public funds. An expenditure is not a gift when it is in the public interest and has a valid public purpose. Specifically, Public Resources Code Sec. 25620.10 authorizes grants from State funds for fuel cell DG systems. In the case of the CaSFCC, the ARB’s contribution of a modest fee and in-kind support would promote the ARB’s overall goals of reducing air pollution from all sources, including stationary sources.”

Budget and Operations within the Budget

“Involvement of the ARB (or its personnel) in financial activities for an organization like the CaSFCC must be undertaken with great caution. Under no circumstance should CaSFCC funds be directly held or administered by the ARB. To do so gives rise to the appearance that the ARB possesses and is allocating funds outside the State’s normal legislative and budget processes, and must be avoided. An ARB employee may manage CaSFCC contracts, but the ARB should not be a party to the contracts. The proposal that the NFCRC will hold and administer the Collaborative’s funds should address this issue satisfactorily.”

Public Records

“Records (documents, electronic data, etc.) in the possession or custody of ARB personnel are subject to the California Public Records Act. Confidentiality under the Public Records Act is limited; all CaSFCC participants should be aware of this. This will be a more significant issue with private-entity participants than with other public agencies. For example, they may have trade secret information that they want to share with the CaSFCC, but not the general public. The Public Records Act allows for protection of trade secret information, but CaSFCC participants will want to handle confidential information with care. The ARB cannot promise blanket confidentiality of records in the possession of ARB and its employees.”

CaSFCC Meetings

“ARB General Counsel does not believe that the CaSFCC, its Core Group, or its Industry Advisory Panel meet the Bagley-Keene Open Meeting Act test for a ‘State body’ subject to the open meeting laws. Consequently, none of these groups would be required to hold open meetings under the Act.”

CaSFCC Activities

“Some proposed activities of the CaSFCC raise concern by the ARB General Counsel. Counsel recommended caution in creating opportunities for demonstration and deployment of member companies’ hardware. The ARB should not be placed in the position of appearing to act entirely on behalf of or at the behest of the member companies. The ARB should also not be placed in the position of appearing to endorse a particular company or product.

The CaSFCC will act primarily through its executive director, who will remain an ARB employee. The executive director, in this role, would be in a difficult position if the CaSFCC’s position on a given issue were different from the ARB’s position. It would be inappropriate, for example, for the executive director ostensibly representing the CaSFCC, to speak at an ARB board meeting if the ARB and CaSFCC have different positions on a given subject. Furthermore, the executive director remains an ARB employee and is subject to all the applicable conflict of interest requirements. These issues are likely to come up with respect to proposed gifts of travel (e.g., a private entity member of the CaSFCC offers to pay for the executive director to attend an event which requires travel and lodging).”

Proposed Budget

The proposed budget for calendar year 2005 is shown below. Income is based on a proposed level for membership fees and an assumed number of potential members. It also assumes income from other sources, such as State-funded programs, foundations and other organizations. With regard to expenses, categories such as special studies and outreach should be considered as placeholders.

The proposed budget is an estimate of potential income and expenditures based on the near-term recommendations outlined in this Roadmap. As noted above, it is recommended that a Budget Committee develops funding and expenditures in more detail for review by the Industry Advisory Panel and approval by the Collaborative’s Core Group.

Proposed 2005 Budget*

Budget Category	2005 Budget	Notes
INCOME		
Salary and Benefits	256,576	In-kind services of ARB
Operating Expenses	58,200	In-kind services of ARB
Other Expenses	23,600	Travel, reproduction, contracts, equipment
NFCRC Expenses	41,000	In-kind staff and operating services of NFCRC
Member Fees	155,000	10 @ 10,000, 10 @ 5,000, 20 @ 250
Other Income	550,000	State funded programs, foundations etc.
Total	705,000	
EXPENSES		
Salary and Benefits	256,576	In-kind services of ARB
Operating Expenses	58,200	In-kind services of ARB
Other Expenses	23,600	Travel, reproduction, contracts, equipment
NFCRC Administration	41,000	In-kind staff and operating expenses
NFCRC Administration	126,000	Staff and operating expenses
Communications	53,500	Includes marketing, outreach, conferences
Auditing Firm/Bank Fees	10,000	Outside firm to audit financial operations
Meetings	5,500	Room rental, refreshments
CaSFCC Special Studies	375,000	Placeholder to be developed by CaSFCC
CaSFCC-Related Research	125,000	Funding for UC research
Reserve	10,000	TBD
Total	705,000	

*Shaded areas indicated in-kind services and not an expense to the CaSFCC

Appendix B CPA Bulk Purchase Initiative

Bulk Purchase of Fuel Cells. When the Collaborative was formed in 2001, founders worked with industry to determine the best method to lower the cost of fuel cells. A mass procurement/ volume installation was believed to be a viable method. As a result, the Collaborative set initiation of a mass procurement program as an initial task.

At that time, the newly formed California Consumer Power and Financing Authority (the Authority) was pursuing expeditious means of increasing electric generating capacity and increasing the role of renewable cleaner, more efficient generation technologies. Clean, efficient distributed power systems were to be an important element of this effort.

With the assistance of the Collaborative, the Authority issued a request for bid (RFB), soliciting responses from industry. The goal was to create a list of eligible fuel cell vendors and an equipment procurement schedule from which the Authority and other public agencies could purchase equipment at established prices.

On February 25, 2002, the Authority announced 14 successful bidders. These bidders, representing fuel cell manufacturers, turnkey installation companies and service providers, were eligible to respond to future invitations for proposals by public entities for state and local government fuel cell projects.

DGS Siting and Procurement Initiative. In parallel, the Collaborative worked with the California Department of General Services (DGS) to develop a distributed generation siting process for DGS facilities. The DGS also identified host sites for early RFPs issued to bidders deemed eligible by the Authority.

The process involved compiling an inventory list, interviewing facility managers, collecting historical utility data, evaluating the results, and directing an expert team to identify specific sites for fuel cell installations. The next step, as identified in this Roadmap, is to utilize this information (and updated information) to draft a systemic plan for deployment that addresses specific technology needs. A longer-term California screening process will involve many of the same criteria. The Collaborative envisions this process becoming part of normal operating procedures when designing and constructing government and other public facilities.

The effort of the Authority and the DGS provided a remarkable start for volume purchases in California. However, the Authority ultimately failed to allocate funding for bulk orders. While the industry complimented the Collaborative for the initiative and acknowledged the development of key deployment partnerships, the failure of the Authority to fulfill its program goal effectively set back the deployment effort.

Appendix C
California Stationary Fuel Cell Collaborative Charter

Charter
California Stationary Fuel Cell Collaborative
(CaSFCC)
March 2001

Purpose

This document presents a vision for establishing a California Stationary Fuel Cell Collaborative. The purpose of the Collaborative is to take a leadership role in facilitating the advancement, demonstration and use of fuel cells for power generation in stationary applications throughout California. In addition to presenting the vision framework, this document includes several attachments that provide further clarification on the vision for the Collaborative.

Mission Statement

“The mission of the California Stationary Fuel Cell Collaborative is to promote fuel cell commercialization as a means toward reducing or eliminating air pollutants and greenhouse gas emissions, increasing energy efficiency, promoting energy diversity, promoting energy independence, and realizing a sustainable energy future.”

Core Group

A small core group will provide the overall guidance on the Collaborative’s objectives including the priority of specific tasks. Specifically, the core group will establish overall objectives, identify available resources, evaluate and recommend proposals as well as establish timelines for key implementation activities. Representatives that are expected to form the Core Group are shown in Attachment 1.

Advisory Committee

An advisory committee will assist with the identification and implementation of specific mission-oriented tasks. The advisory committee will also assist with identifying key barriers and opportunities concerning the commercialization of fuel cells for stationary power generation applications. Representatives that are expected to be invited to participate on the Advisory Committee are shown in Attachment 2.

Key Goals

- Facilitate the commercialization of fuel cell technologies by funding pilot projects in partnership with stakeholders.
- Implement an inter-organizational policy to utilize environmentally sensitive power generation technologies such as fuel cells, solar, and wind in distributed generation applications.
- Work with utilities and regulators to adopt policies that encourage the use of fuel cells for power generation.

- Develop and establish an interagency agreement regarding the use of fuel cells for power generation in government facilities.
- Produce fuel cell education and outreach activities and opportunities to facilitate the market adoption of stationary fuel cell systems.

Specific tasks that are tied to the above goals are shown in Attachment 3.

Commitment

An important requirement for successful implementation of the vision is to ensure that sufficient resources are dedicated to establishing the California Stationary Fuel Cell Collaborative and to implementing its key goals and tasks. It is anticipated that ARB will make staff resources available to coordinate the effort. It is also anticipated that organizations on the Fuel Cell Core Group and Advisory Committee will commit resources to implement key tasks.

It is expected that participants in the California Stationary Fuel Cell Collaborative will provide co-funding to support priority projects that are identified. Preliminary estimates suggest that the initial support (first year) of all participants will range between \$3,000,000 and \$6,000,000. More precise estimates will be developed as specific tasks are identified, defined, and approved by the participants.

The University of California “National Fuel Cell Research Center” (NFCRC) will serve as the host site for the California Stationary Fuel Cell Collaborative and (1) provide the staff and resource administrative support, (2) maintain the CaSFCC web site, (3) provide the meeting facilities for the Core Group, Advisory Committee, and many of the workshops, and (4) support the information and educational clearinghouse of resources developed by the CaSFCC.

Next Steps

As a next step, it is recommended that we make contact with each of the proposed Core Group representatives to initiate the formation of the Stationary Fuel Cell Collaborative. Staff has already contacted several organizations represented in the Core Group including the South Coast Air Quality Management District, the National Fuel Cell Research Center, the California Energy Commission and the Department of General Services to identify projects underway as well as potential projects that could be funded. A proposed agenda for the first meeting of the Core Group is shown in Attachment 4.

Attachment 1

Proposed Core Group Representatives March 2001

The core group is expected to include representatives from:

- California Energy Commission
- U.S. Department Of Energy
- South Coast Air Quality Management District
- Los Angeles Department of Water and Power (?)
- Southern California Edison (?)
- Pacific Gas and Electric (?)
- San Diego Gas and Electric (?)
- Air Resources Board
- National Fuel Cell Research Center
- California Department of General Services
- California Public Utilities Commission

Attachment 2

Proposed Advisory Committee Representatives March 2001

The advisory committee is expected to include representatives from:

Fuel Cell Manufacturers

- Ballard Power Systems
- FuelCell Energy Corporation
- International Fuel Cells
- Siemens Westinghouse Power Corporation
- DCH/EnAble
- Metallic Power
- Plug Power, LLC
- DAIS Analytic Power
- H-Power Corporation

Governmental Agencies

- California Environmental Protection Agency
- California Department of General Services
- California Department of State and Consumer Affairs (?)
- California Department of Parks and Recreation
- California Department of Transportation
- California Highway Patrol (?)
- U.S. Federal Office of General Services (local to California)
- National Park Service
- South Coast Air Quality Management District
- Other Air Quality Management Districts

Utilities

- Los Angeles Department of Water and Power
- Southern California Edison
- Pacific Gas and Electric
- Sacramento Municipal Utility District
- City of Anaheim
- City of Redding
- City of Roseville
- Northern California Power Authority
- California Department of Water Resources

Fuel Suppliers

- Southern California Gas Company
- Enron
- American Methanol Institute
- Pacific Gas & Electric
- Other natural gas suppliers to state of California

Potential Developers

- Enron
- RealEnergy Inc.
- The Irvine Company
- Presidio Trust
- WorldCom
- Sprint
- Disney Corporation
- Silicon Valley Manufacturing Group

Non-governmental Organizations

- National Fuel Cell Research Center
- U.S. Fuel Cell Council
- World Resources Institute
- Union of Concerned Scientists
- W. Alton Jones Foundation
- Hewlett Foundation
- Packard Foundation
- Energy Foundation
- World Watch Institute
- Natural Resources Defense Council

Attachment 3

Specific tasks tied to the goals may include: March 2001

A. Short-Term Tasks

- 1) Issue Press Release on the formation of the California Stationary Fuel Cell Collaborative.
- 2) Enter into an interagency agreement to include fuel cells or other environmentally sensitive "power generation" alternatives in the design and budget for new buildings constructed by the State of California. At the present time, five projects are under development by the Department of General Services that could be candidates for the installation of fuel cells. Included are the new headquarters for the Office of Emergency Services, two Caltrans Transportation Management Centers, a correctional facility in Coalinga and the DHS Richmond Health Lab.
- 3) Purchase of fuel cell power generation units by California government agencies
 - i) for Cal/EPA headquarters building
 - ii) portable units for demonstration purposes
 - iii) for fuel cell partnership

Preliminary work indicates that fuel cells would be compatible for these applications and that such installations could be operational in the near term (approximately 6 months). We are working with the Department of General Services and fuel cell manufacturers to identify installation requirements, potential fuel cell technologies and capital and operation costs for these installations.

- 4) Support local implementation of fuel cell generation units in areas with transmission barriers and threats of critical electricity shortage.
- 5) Support pilot projects of small units in industrial sectors with high sensitivity of power reliance.
- 6) Support key demonstration projects throughout the state that have high visibility and capability to facilitate market adoption of stationary fuel cell technology.
- 7) Develop a power generation fuel cell page on the ARB's web site. This site could be used to identify the projects supported by the Fuel Cell Collaborative, emerging technologies, opportunities for cooperative agreements, the effectiveness of particular applications and the environmental benefits of fuel cell technology.

B. Medium-Long Term Tasks

- 1) Support projects that demonstrate the effectiveness of fuel cell technologies by facilitating the siting and testing of fuel cells used for stationary power applications.
- 2) Partner with stakeholders to fund key stationary fuel cell demonstration projects. Several applications appear to be promising, including the application of fuel cells to power portable air monitoring equipment and mobile air monitoring vans, the use of fuel cells to recharge electric vehicles, and the use of fuel cell and reformer systems to meet both stationary power and transportation fueling infrastructure needs, and others.
- 3) Provide advice to organizations developing applicable regulations and guidance so that the environmental benefits of fuel cells for distributed power generation are considered.
- 4) Develop and advance tax credit proposals and other incentives for the use of fuel cells for power generation.
- 5) Communicate with code and standard setting bodies to inform them of fuel cell power generation development activities and deployment needs.
- 6) Host/co-host educational workshops to further the transfer of technical developments and policy activities.
- 7) Work with universities to include fuel cells in university curricula, university systems, and education programs.
- 8) Establish and maintain effective communication with a broad range of stakeholders. Stakeholders are expected to include fuel cell manufacturers, utilities, fuel suppliers, governmental agencies, educational institutions, environmental organizations, regulatory bodies, and others.

Attachment 4

Proposed Agenda for First Meeting of Core Group¹² March 2001

- I. Introduction of Core Group
- II. Purpose of Core Group
- III. Mission Statement
- IV. Establish Formal Working Group
- V. Review Current Policies of Agencies and Organizations Regarding the Use of Fuel Cells for Power Generation Applications
- VI. Review Proposed Distributed Generation Regulations
- VII. Discuss the Potential for Interagency Agreement on Fuel Cells
- VIII. Draft Outline of Potential Agreements
- IX. Identify Potential Short-Term Projects
 - A. Projects
 - B. Funding
 - C. Timing
- X. Next Steps/Conclusion

¹² The Core Group will be moderated by a representative from the National Fuel Cell Research Center.