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Project Title: Fueling Sustainable Futures (FSF): Pathways to Foster Awareness, Understanding and Action

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Project Narrative

Project Objectives

Building on the experience and strength of an interactive, hands-on, science and technology program (the Utah Science Center); the experience and effectiveness of the Utah Clean Cities Coalition activities and programs; and the growing need and interest for information and the means for the public to take action, this project will develop and provide awareness and education events, resources, activities and curricula for a range of audiences and publics on the four specific topics in the RFP's Area of Interest 3: Education and Outreach Workshops for Petroleum Reduction Fuels and Technologies. We will address the topics in a set of presentations, workshops, and community events ranging from general to the highly focused:

- Energy: The Very BIG Picture
- Transportation and Energy: The Big Picture
- From Petroleum to Biofuels: Combustion, CO2, Sustainability, Climate Action
- Action Now: Idle Reduction, Efficiency and CNG, Propane
- Action Now and Later: Biodiesel, Bio-alcohols, and Other Biofuels—including those from algae and engineered organisms

The overall objective is to develop and provide resources and processes by which to motivate, involve, inform, and activate a wide range of audiences and the general public on the need and opportunities to reduce the use of and the reliance on fossil – derived petroleum fuels. A modern, expanded, comprehensive Clean Cities curriculum is a key outcome of the project.

Specifically,
Objective 1: Research, develop, and fine-tune audience-targeted curricula, workshops, and activities in the topics related to the DOE RFP.

Objective 2: Present and implement these resources and materials, including activities to train the trainer, with collaborating Clean Cities Coalition Coordinators in all six regions nationally, their audiences, the media, and the general public via a wide range of events.

Objective 3: Disseminate the project locally, regionally and nationally via our National and Regional Advisory Boards, the web/Internet, the media, newsletters and other publications, and professional/national meetings and conferences.

The lead agency is the Utah Science Center (USC, URL1), providing unique, hands-on, highly motivating activities related to science and technology with a focus on energy and the environment. The second major partner is the Utah Clean Cities Coalition (UCCC, URL 2), representing the entire Clean Cities Coalition network. Other participants include several educator-consultants, a key group of collaborators, and all six CCC regions.

The targeted audiences are a diverse group: local and regional school district driver education programs and student transportation fleets, local and regional government fleets, the audiences served by the Clean Cities Coalition regions, the media, parents, drivers, and the general public. We will utilize workshops, community events, websites, updated materials, and exhibits/models/simulations based on current science and research from our partners and incorporate information about Science, Technology, Engineering and Mathematics (STEM) based careers related to sustainable fuels.

We will also challenge the public to participate and contribute their thoughts through web blogs, contests, competitions and community projects. We expect to reach and impact 100,000 people in Phase/Year I, and up to another 100,000 in Phase/Year II through a peer trainer 'amplification' process and by making maximal effective use of the media and our website. This is described in Criteria 2, Figure 3 on page 13

Merit Review Criterion Discussion

Criteria 1: **Probability of Project Success Based on Team Expertise and Prior Experience**

Ability to Assemble a Team

One of the major strengths of the partnership between USC and UCCC is the breadth and depth of their experience and respective networks. Robin Erickson, UCCC Director, works extensively with government entities, nonprofits, and the corporate sector on transportation issues. She is an active participant in the Clean Cities Coalition, particularly the Northwest Region, some of whose members are included in this proposal. UCCC brings its considerable knowledge about transportation fuels to the table.

USC is an informal science and technology education nonprofit with extensive experience in hands-on, interactive exhibits. USC is funded by the Utah State Office of Education, a large group of science-based and technology-intensive industries as well as foundations and related grants. It works closely with government agencies, higher and public education institutions, and community organizations.

Qualifications of Key Project Personnel

The key project personnel and their expertise include:

Joe Andrade, Ph.D., USC Director and Principal Investigator for this FSF project, is the former dean of the University of Utah College of Engineering. He has largely retired from the University and works almost full time with USC. He is well known in the scientific community both locally and nationally. His *Science Without Walls* television course on KUEN Channel 9 has aired for the last 10 years, reaching thousands in the broadcast area (all of Utah) and many more via the online Utah Education Network. He holds seven (7) patents and has authored over 150 professional science publications, including a set in science education and informal science areas.

Robin Erickson, Utah Clean Cities Coalition Director and major partner in the FSF project, formerly managed the fleet for the Newspaper Agency Corporation in Salt Lake City, a fleet of over 200 alternative fuel vehicles using compressed natural gas, propane and biodiesel. She was instrumental in sponsoring, developing and distributing four newspaper tabloids, each with a circulation of 350,000, focused on alternative fuels, energy and conservation. One of these, On the Road to Fueling the Future, generated the creation of a set of classroom teaching materials for 4^{th} – 12^{th} graders, and is used in an estimated 100 classrooms in Utah and available for other states.

Jaikumar AT is a mechanical engineer with a background in automobiles and fuels with a focus on biodiesel. He is developing biodiesel and biofuels curricula, and interactive materials with USC. This includes the recent acquisition and modification of a diesel vehicle for use in implementing project workshops and community events.

Mary Anter, Community Program Implementor, holds a BS in Biology/Psychology Health Sciences and has experience in exhibit design, workshop presentations, and informal science education through her previous work at the Maryland Science Center. She coordinates and implements community programs and events for USC.

The FSF project will engage a small group of consultants to aid in the development and review of curricula, materials, and content for all presentations and programs. This includes researchers in biofuels and related technologies.

Gary Stewardson is on the Utah State University Engineering faculty and works on biodiesel, biofuels, and energy curricula and materials, focused on the middle school audience. His Biodiesel Unit includes activities on the processing of biodiesel from oils and algae, chemical and physical property testing, and direct assessment using test engines.

David Richerson serves as Program Manager of the University of Utah team focused on Engineering outreach and STEM activities in the K-12 population. Richerson's personal activities include helping to develop the local idle reduction programs via Grades 4 to 6 activities, classes, and teachers, including a strong air quality component. One of his key classroom teacher collaborators is Patti White, who will serve on the FSF Regional Advisory Board. Richerson's extensive Energy and Air Quality Lesson Plans provide a good foundation for components of the FSF curricula and materials.

Shea Wickelson Pickelner is our local 'biodiesel lady'. She received a Toyota Tapestry grant some years ago to purchase a small bus which her school, City Academy, uses for basic transportation and as a model and example of biodiesel use in the region. Her chemistry students produce most of the bus's biodiesel. She has developed a renewable energy curriculum for high school chemistry which focuses on biofuels, biodiesel, algae. She is excited to develop the curriculum more fully and make it widely available through this FSF project. Pickelner's bus will be used for local FSF activities and presentations (Figure 1, URL 3).

Figure 1: City Academy Bus and Students

Hugh Bollinger is a plant ecologist with considerable experience with native plants and related botanical topics. His technical background and extensive efforts and activities in eco - and carbon – footprint analysis and mitigation, enable him to contribute greatly to the materials and curriculum development team.

Mike O'Malley is the Communications Director for Utah's unique Utah Science Technology and Research (USTAR, URL 4) program. His strong interest and background in energy and biofuels along with his press, communication, and marketing skills will enable FSF to effectively serve and engage our media and general public audiences.

Four people are associated with Utah State University (USU), which is the home of the USTAR fuels from algae program:

Jeff Muhs directs the fuels from algae program; he and his co-workers will provide expertise, content, materials, and samples as needed for our presentation, workshops, and programs.

Ralph Whitesides and Dallas Hanks are with the Plants, Soils, and Climate Department and are the expertise behind Utah's Freeway to Fuels program – growing oil/fuel – rich plants on highway borders. Freeway to Fuels is now a national effort. They are also key to the Central Utah Biodiesel project (URL 5), whose founder, David Drake, serves on the FSF National Advisory Board. These individuals provide expertise and perspective related to biomass and oil from plants as sources of renewable transportation fuels. **Gary Stewardson,** the fourth member of this group, is one of our consultants (above, page 3).

Doug Wendell, Professor of Chemistry at Snow College in Central Utah, now heads the Central Utah Biodiesel Team and serves as an FSF collaborator.

John Duffy is a driver education instructor at a large, local urban school district, and serves as president of UDTSEA, the Utah chapter of ADTSEA, the national organization for high school driver education programs. John will facilitate the inclusion of FSF materials and perspectives into local and national driver education curricula and teaching, as well as facilitate access to driver education instructors in the region – a key audience for our workshops and presentations.

Dan Sims is a fuels engineer with Cardwell Distributing, Utah's largest biodiesel fuel distributor. Cardwell has agreed to provide samples and information needed for our workshops and curricula.

Rick Weiss is with Kellerstrasse Oil, a new biodiesel distributor in Northern Utah working with the Renewable Energy Group in Iowa. They, too, will provide samples and technical expertise and perspective.

Jacob Kingston is CEO of WRE Biofuels, a local biodiesel refiner and distributor on the UT-ID border

Lamont Nelson and Greg Nuzman are the Fleet Manager and Asst. Fleet Manager, respectively, for Salt Lake City and Salt Lake County. They have worked closely with Robin Erickson of UCCC, the key partner in FSF. They will provide access to their drivers and aid in scheduling workshops and related presentations.

Rick Dalton and Michael Millet are on the faculty of Salt Lake Community College (SLCC), the premier 2 year institution in the region and provider of a wide range of technical, certificate, and related programs. Dalton will work closely with FSF on including our perspectives, materials, and curricula into their large truck driver training programs. Millet will do likewise with his Auto Technology program. Millet has extensive experience with CNG-propane and idle reduction. Both Millet and Dalton have worked with Erickson and UCCC. SLCC will provide Continuing Education credits for participants in FSF programs which meet the appropriate requirements.

Dan McCool heads the University of Utah's Undergraduate Studies program. This large and popular undergraduate program is very interested in FSF and will provide interns, materials, and perspective related to FSF objectives and needs.

Table 1: Partners, Consultants and Collaborators

Project Partners

Name	Role	Expertise	Key Persons	Title
USC	Lead Partner	Informal Education	Joseph Andrade	Director
UCCC	Partner	Clean Cities activities	Robin Erickson	Director

Project Consultants

Name	Title	Institution	Role	Expertise
Stewardson, Gary	Faculty, Engineering	USU	Middle School Curriculum	Biofuels, energy
Richerson, David	Faculty, Engineering	UU	Middle School activities	Energy, Climate, Biofuels
Pickelner, Shea	Faculty, Chemistry	City Academy High School	Chemistry Curriculum	Chemistry, Biofuels, Environment
Bollinger, Hugh	Plant Ecologist	Retired	Plants, biomass	Plant ecology

Project Collaborators

Name	Title	Institution	Role	Expertise
O'Malley, Michael	Communications Director	USTAR	State and USTAR Liaison	Communications, Media, Dissemination
Muhs, Jeff	Professor	USU and USTAR	New biofuels and processes	Algae, Bioprocessing
Duffy, John	President	UDTSEA	Jordan District	Driver Education
Sims, Dan	Engineering	Cardwell Distributing	Biodiesel Sources	Biodiesel Technology
Weiss, Rick	Engineering	Kellerstrasse Oil	Biodiesel Sources	Biodiesel Chemistry
Nelson, Lamont	Fleet Mgr	Salt Lake City	Fleet Drivers	CNG, IR
Nuzman, Greg	Fleet Mgr	Salt Lake County	Fleet Drivers	CNG, IR
Dalton, Rick	Faculty	SLCC	Truck Driver Educ Program	Truck Fuels and Driving
Millet, Michael	Faculty	SLCC	Auto Technology	CNG, Propane, IR, biofuels
McCool, Dan	Faculty	UU	Environmental Studies Interns	Environment Policy
Whitesides, Ralph	Faculty	USU	Freeway to Fuels	Plant Sources
Hanks, Dallas	Grad Student	USU	Freeway to Fuels	Plant Sources
Francis, David	Faculty	USU Extension	Informal Ed, 4H	STEM, informal education
Kingston, Jacob	Founder	WRE Biofuels	Technology	Biofuels, Renewables

The collaborator list is likely to grow as we move toward implementation of FSF in July 2009. The abbreviations are defined on pages 28.

Previous Success in Similar Projects
Andrade has conducted multi-partner, multi-year research funded by federal grants through his extensive work at the University of Utah. The USC mobile science education outreach program, Leonardo on Wheels-Science, has operated successfully statewide since October 2004 due to his efforts to conduct large scale collaborations

Erickson is a recognized leader locally and nationally in the effort to reduce our dependence on petroleum and to reduce mobile pollution. She was vital in developing and distributing four (4) different tabloids entitled: Utah Air Quality Challenge, Transportation for a Better Tomorrow, Charting Utah's Growth, and On the Road to Fueling the Future. The Director of the UCCC for nearly two years, Erickson has staffed committees, organized events, pulled together ad hoc committees and partnerships, worked on state legislative bills, and prepared grants.

Strength of Project Partners and Extent of Active Participation of Clean Cities Coalitions and State and Local Agencies
Both project partners, USC and UCCC, are well established 501(c)3 nonprofit organizations with local, regional and national professional networks. Each receives some of its funding through state sources and works with numerous government, education and community-based organizations. Members of these groups will serve on the project's Regional Advisory Board (RAB, Table 2, below). Additionally, nationally renowned experts in the areas of alternative/renewable, driver education, fleet management, energy, and informal science have agreed to join the National Advisory Board (NAB, Table 2, below). The collective insight of both boards' members will greatly support the successful implementation and completion of the project.

National Advisory Board members Include:

Joe Verrengia, National Renewable Energy Lab (NREL), is an expert on data visualization, including planetary and spherical projection. He will advise and provide perspective on our Big Picture approaches, as well as serve as a liaison and connector with NREL.

Roger Mayes is with Idaho National Lab (INL), focusing on education and outreach. INL is a key sponsor of USC's Leonardo on Wheels – Science mobile program, which is an important component of FSF. He will advise and provide perspective on education, schools, and help coordinate with our Idaho activities, as well as serve as liaison with INL.

Fred Mottola's name and career is synonymous with Driver Education. He works with Prentice-Hall on their books and materials for driver education. Mottola is CEO and President of Interactive Driving Systems, Inc., and Executive Director of the National Institute For Driver Behavior, an organization dedicated to providing driver risk prevention education. His energy and space/area method for safe driving complements FSF interests and activities in efficient driving. Mottola works with driver education programs in six states and several Canadian provinces. He will be very helpful in the incorporation of FSF materials and curricula in driver education programs throughout the US and Canada.

Dianne Nielson is the Energy Advisor for Utah Governor Jon Huntsman and works closely with him on the National and Western Governors' Associations. She will bring a national perspective on activities, interests, and needs of all states.

Dan England is with CR England Trucking, one of the largest trucking firms and fleets in the

Western United States. England also serves as Vice President of the American Trucking Association (ATA). ATA recently advocated a national speed limit of 65 mph for all vehicles to facilitate fuel conservation and efficient driving. He brings a trucking and a national perspective to the NAB and to FSF.

Regional Advisory Board members are:

Ann Ober and Vicki Bennett head Environmental Programs and advise Mayors Corroon and Becker, Salt Lake County and Salt Lake City, respectively. The major urban areas represented by Salt Lake City and County are very environmentally aware, with ongoing incentive programs for renewable and efficient energy use. Ober and Bennett will provide regional perspectives and serve as liaisons with the Mayors and government fleets, including the Salt Lake City operated Salt Lake International Airport.

Ron Dallinga will provide aviation and airport perspectives to FSF. It is interesting to note that the Utah State University biofuels program is focused on jet fuels.

Dan Locke will provide public transit perspectives. The Utah Transit Authority (UTA) operates the extensive bus, light rail, and commuter rail systems in the region.

David Tundermann manages the Environmental Law group at a major local legal firm. He will provide perspectives related to law, regulations, certification, and other legal provisions.

John Thomas and Abdul Wakil work in the Utah State Dept. of Transportation. Wakil is closely involved with the Freeway to Fuels program.

Brian Fays is with State Fleet Operations and will advise and assist on workshops for State drivers and employees.

Bryce Bird is the Planning Manager with the Division of Air Quality and has both the expertise and perspectives regarding air quality, transportation-derived emissions, and related issues.

Utah State Office of Education (USOE) advisors include **Gail Johnson**, responsible for State driver education program requirements and curricula; **Murrell Martin** who oversees student transportation, and thus all state school buses and fleets in the various school districts; **Velma Itamura and Darrel Andelin**, are science and technology curriculum specialists/supervisors, respectively.

Susan Davis of Questar Gas will provide the industry perspective on CNG-propane; she has worked extensively with Erickson and UCCC.

Barbara Gentry will represent the Utah Science Teachers Association (USTA). She has worked closely with Andrade regarding hands-on STEM education.

Jason Taylor directs the Utah Society for Environmental Education (USEE), the local group working most closely with teachers, parents, and USOE on environmental education.

Jenny Hatch is with the National Energy Foundation (NEF); NEF provides a wide range of materials and services for energy awareness and education.

Patti White represents teachers. White's students have helped develop the local idle reduction and fuel efficiency programs; they have presented to various community groups and the Legislature and won several national awards.

Judy Fahys is a reporter for the largest local daily newspaper, the Salt Lake Tribune, covering energy subjects and issues. She will help provide a media perspective as well as access to print media professionals.

Sheri Quinn is the reporter and producer for Science Questions, a weekly science-based radio show airing on public radio (URL 6). She is experienced in science content and technical subjects. She will help provide the perspective of and access to the broadcast and web media constituencies.

Table 2: Advisory Board Members

National Advisory Board (NAB)

Name	Affiliation	Expertise	Role	Comment
Verrengia, Joe	NREL	Planetary visualization	Advise re: NREL and visualization	Serve as liaison with NREL
Mayes, Roger	INL	Energy outreach	Advise re: INL	Liaison INL
Mottola, Fred	NIDB	Driver Education	Advise re: Driver Ed textbooks and curricula	Dissemination to other states
Drake, David	Texas A and M Univ	Biofuels from Plants	Advise re: Plant sources	Central UT Biodiesel Proj.
Nielson, Dianne	State of Utah, Energy Advisor	Energy and Environment	Advise re: State initiatives	Former Head UT Dept. Environ. Quality
England, Dan	England Trucking	V.P., Amer. Trucking Assoc (ATA)	Advise re: ATA Initiatives	Liaison with trucking industry

Regional Advisory Board (RAB)

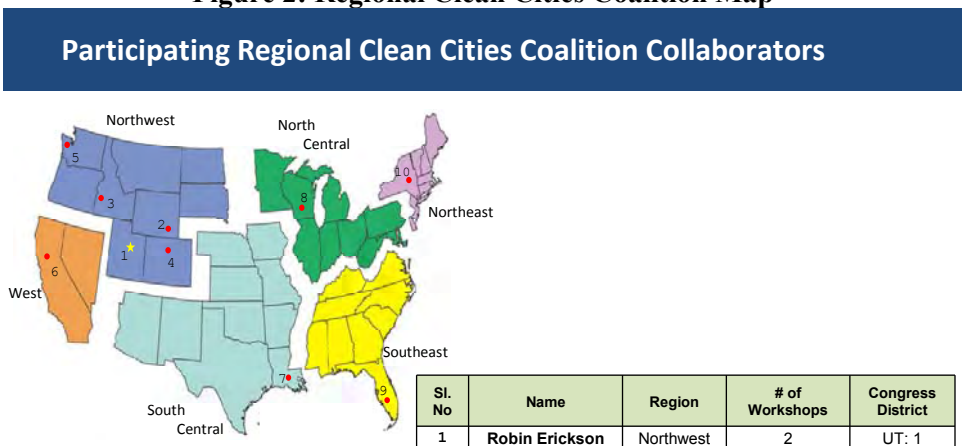
Name	Affiliation	Expertise	Role	Comments
Ober, Ann	Salt Lake County	Environmental Programs	Advise re: County	
Bennett, Vicki	Salt Lake City	Environmental Programs	Advise re: City	
Bird, Bryce	State of Utah	Air Quality	Advise re: Air Quality	
Johnson, Gail	Ut State Office Education	Driver Education	Advise re: Driver Ed Curriculum	
Tundermann, David	Parsons, Biehle, & Latimer Law	Environmental Law	Advise re: incentives and policies	
Locke, Dan	Ut Transit Authority	Transport Environment	Advise re: Sustainable Fuels	Role of public transit

Fahys, Judy	Salt Lake Tribune	Energy reporting	Print Media	Role of Media
Quinn, Sheri	Science Questions Public Radio	Science Programs	Broadcast Media	Role of Media
Dallinga, Ron	Salt Lake International Airport	Aviation Environment	Aviation Fuels	Air and Public Transit
Fays, Brian	State of Utah	Fleet Operations	Sustainable Fuels and Fleets	
Taylor, Jason	USEE	Environment and Energy	Environmental Education	
Hatch, Janet	NEF	Energy	Materials	
Gentry, Barbara	USTA	Science Education	Curricula and Materials	
Itamura, Velma	USOE	Science Curriculum	Curricula and Standards	
Andelin, Darrell	USOE	Technology Curriculum	Curricula and Standards	
Thomas, John	UDOT	Transportation	Infrastructure and Fuels	
Wakil, Abdul	UDOT	Freeway to Fuels	Highways	
Davis, Susan	Questar	Propane/CNG	Industry perspective	
White, Patti	Morningside Elem School	Teaching, Curriculum	Environment, Idle Reduction	
Martin, Murrell	USOE	Student Transportation	School District Fleets	

The abbreviations are defined on pages 28.

All six (6) Clean Cities Coalitions will participate in the project. The contact names, addresses, regions and a map displaying the distribution of their locations are below. Each regional coordinator is responsible for two workshops over the course of the FSF project and is expected to work with state coordinators in their areas to recruit targeted audiences from the entire region. All have signed letters of commitment to the project (please see Letters of Commitment, following the Project Management Plan).

Figure 2: Regional Clean Cities Coalition Map



Sl. No	Name	Region	# of Workshops	Congress District
1	**Robin Erickson**	Northwest	2	UT: 1
2	**Sandy Shuptrine**	Northwest	1	WY: ALL
3	**Beth Baird**	Northwest	1	ID: 1 & 2
4	**Alicia Archibald**	Northwest	1	CO: 5
5	**Stephanie Meyn**	Northwest	1	WA: 7
6	**Suzanne Seivright**	West	2	CA: 41, 44,45
7	**Rebecca Otte**	South Central	2	LA: 1,2,3
8	**Francis Vogel**	North Central	2	WI: 4
9	**William Young**	Southeast	2	FL: 8, 15
10	**Rita Ebert**	Northeast	2	NY: 1,2,3

utah science center

Adequacy of the Team Resources to Successfully Complete the Proposed Work
Both Andrade and Erickson have initiated and successfully completed numerous wide-ranging projects. Andrade currently oversees a mix of nine (9) federal, state, corporate, and local and national foundation projects which require progress reports. He delegates projects to USC staff and then carefully monitors the progress. Erickson coordinates with entities throughout Utah to present information on alternative fuels and their applicability to the state's transportation system and manages the grants awarded to her office.

Consultants, collaborators and NAB/RAB members were all recruited to provide specific and vital information to support the FSF project. All of the key personnel listed above (page 2) possess extensive experience with conducting workshops and community events. We have budgeted for up to three (3) part time educators who we will hire to help with workshop presentations as needed; we have included a coordinator specifically for the project to manage the daily operations.

Besides the personnel, USC has workshop space in the Salt Lake Center for Science Education (SLCSE, URL 7) where we use our equipment, tools and supplies to create, refurbish or alter the interactive exhibits. Volunteers from local corporations, such as Williams Northwest Pipeline, assist the staff with these efforts. We recently received funding through a local source to help with the purchase of a newer and dependable diesel truck that is invaluable in hauling the exhibits to different locations. The truck will act as a biodiesel-fueled model and example for workshop attendees.

Quality and Strength of Letters of Commitment
The partner letters of commitment clearly indicate their intended contributions to this project as do the letters from each regional coordinator, which state their commitment to generating workshops in their geographic areas.

Coordination with Industry
Our collaborators include representatives from Cardwell Distributing (biodiesel fuel delivery), Kellerstrasse Oil (biodiesel marketer), and WRE (biofuels and renewables). Dan England from C.R. England Trucking Company will serve on our National Advisory Board. These are dynamic lists that may expand as more industry representatives hear about and seek to join the project.

Proven Ability to Work Strategically with Media on Sustainability Issues
Erickson has had extensive success in working with the media to deliver information to the general public. She sponsored and developed four (4) different multi-page newspaper inserts or tabloids that each reached 350,000 households. One of these, On the Road to Fueling the Future, has contributed to the creation of teaching materials for 4^{th} – 12^{th} graders.

USC enjoys a long standing relationship with KCPW, a local NPR station, which has broadcast our programs in the past. We recently began collaborating with Science Questions (SQ), a weekly science program aired on Utah Public Radio (URL 5). Sheri Quinn, the Peabody Award winning reporter and producer for SQ, will serve on the Regional Advisory Board as will Judy Fahys, a reporter for the daily newspaper, *The Salt Lake Tribune.* The current USC media template lists all of the media contacts throughout Utah for print, radio and television which allows us to reach media personnel quickly.

As part of this project, the partners and staff will design and develop a Media Awareness and Involvement Plan (MAIP) using this template to announce upcoming workshops and events. A second component of the MAIP is a packet for media representatives containing scientifically sound fact sheets related to each subarea in this area of interest, and video and audio clips, which we will update regularly. The third part of the MAIP is inviting media to participate in hands-on workshops and contribute their newly gained, science-based knowledge to the public. Rather than just taking notes and possibly merely observing, media representatives will explore and discover the nature of alternative and renewable transportation fuels for themselves. MAIP will expand the project beyond just Utah with the aid the regional CCC workshops and the project coordinator.

<u>Criteria 2</u>: <u>Probability of Project Success Based on Project Management Plan/Statement of Work</u>
Responsiveness and Relevance of the Application to the Programmatic Goals and Requirements
The programmatic goal for Interest Area #3 is to "raise awareness and foster a greater understanding of alternative fuels and advanced technologies through a targeted outreach and education effort" (1).

This project, Fueling Sustainable Futures (FSF): Pathways to Foster Awareness, Understanding and Action proposes an exciting array of outreach methods to enlighten, educate and energize targeted audiences about alternative and renewable transportation fuels. These include interactive, hands-on workshops at a variety of venues (malls, libraries, community centers, for example); website information, simulations and blogs; press kits; contests, competitions and projects; and curriculum materials incorporating on-going research and information currently used in education programs, and geared to different levels of learning (junior and senior high school, college and above). We will design the project for specific groups such as fleet managers, the media and high school driver education students as well as the general public.

In Phase I, we will work with the Regional Clean Cities Coalition members, our consultants, collaborators and advisory board members to present six (6) workshops, one in each region. During Phase II, we will offer six (6) regional workshops plus an additional four (4) to cover the states of Colorado, Wyoming, Idaho, and Washington/Oregon. The specific target audiences are listed below in Table 3.

Table 3: Target Audiences

Audience	Relevance/Role	Resources/Materials	Timing	Metrics
Junior High	Anticipate driving	Hands on Science Leo on Wheels – Science Curricula	Start late 2009	Schools Students
High School	Driver Education Careers and Jobs	Driver Ed curricula Chemistry curricula Career/job information	early 2010	Schools, teachers, students
Parents	Teen driver tensions	Community – School events	early 2010	Parents, siblings, friends
Fleets	Fuel and Vehicle Purchasers	Agency/firm training, social events (annual picnic, etc.)	mid-2010	Fleet managers, drivers, families, networks
Clean Cities Coalitions	CNG and Idle Reduction interests and expertise	Interactive Materials, web distribution, Big Picture appreciation	late 2009	Current Clean Cities audiences and trainers
General Public	Fuel and Vehicle Purchasers, Drivers	Interactive materials via special and community events	mid-2010	Numbers participating, web follow-up
Media	Influencers, information distribution	Media kits, including audio/video clips, special workshops	early 2010	Numbers participating, media coverage
Museums, Libraries	Youth and public	Events in their facilities, web links, materials	late 2009	Numbers participating, web follow-up

Likelihood of Successfully Completing the Project Based on the Following Six Points

1. Merits of the Workshop Topics and the Need for Developing These

We have identified several reasons for the need to offer these workshops, which will include information on all four (4) Interest subareas: biodiesel and biofuels, ethanol and other alcohols, natural gas and propane, and fuel reduction and idling:

a. Americans still rely heavily on their cars, especially in the Intermountain West with its long distances between population areas;
b. President Obama's call to develop alternative and renewal fuels as one approach to climate change has stirred many states to action. Utah Governor Jon Huntsman's involvement with the Western Governor's Action on Climate Change and his support for alternative and renewable fuels is just one example of to this; and
c. The need to create fuel independence, which means researching and developing alternatives such as biofuels and other types of alcohol based products.

2. The Audience Targeted Along with a Proposed Marketing Plan to Recruit Clean Cities Workshop Hosts and Attendees

The targeted audiences, along with pertinent information about them, are listed above in Table 3. A key feature of this project is a process we call amplification that is essentially social networking. We train the trainers or the students and they in turn share the information with others. We anticipate approximately 800 trainers directly receiving information from the workshops (50 people per workshop x 16 workshops).

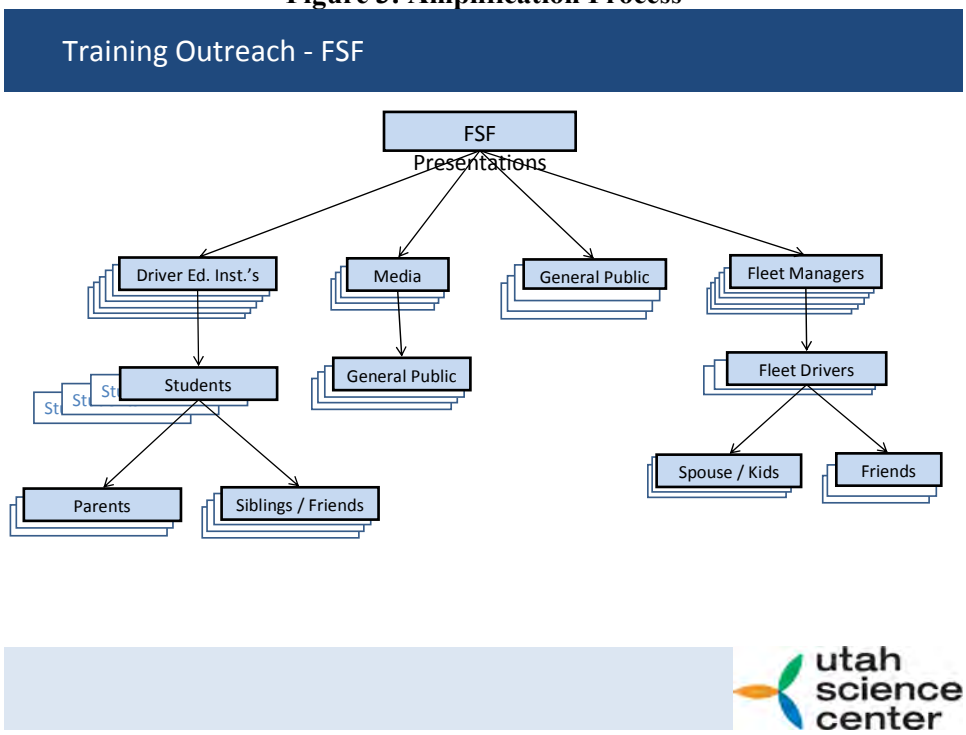
Each of them returns home to host workshops within their smaller geographic area (part of a state or a large metropolitan center, for example) so that exponentially these professionals and students reach thousands of others. The media and the public add to the number of people impacted by the FSF project. Print, radio and television resources are critical to reach the general population with science-based, unbiased information. Our community events, held throughout the two year project and beyond, are designed to engage hundreds of neighborhood participants. Figure 3 below exemplifies this rippling effect.

The marketing plan we intend to use to begin this process includes: combining USC and UCCC mailing lists; recruiting workshop hosts with the help of the Regional CCC Coordinators; information and blogs on the website; articles and interviews with media; PSAs on radio and television; follow-up with workshop participants for additional training if necessary; and pieces in related newsletters.

3. The Type of Materials to be Developed

The workshops are not the typical power point--take notes while someone lectures format. They are designed to engage participants from the very beginning with questions and group answers (What is Energy), moving from the general to the specific. They incorporate interactive exhibits, such as small, hand cranked generators which everyone tries, to illustrate basic principles of physics and chemistry. Attendees come away knowing about alternative and renewable transportation fuels more thoroughly because they exchange information with each other during the whole workshop process. We will develop materials, exhibits and activities that support this concept.

Figure 3: Amplification Process



4. The Strategy/Plan to Develop the Materials

Andrade has already accumulated important data from which to create a basic curriculum and will complete the four subtopics further with the help of our consultants, collaborators, and national

and regional advisory board members during July – September 2009. Andrade specifically recruited consultants (see page 5) for their expertise in either developing science curricula and materials, or their ability to contribute to this process. He and the project coordinator will develop a set of milestones for just this assignment so that all materials and curricula are ready by the end of September. This includes sharing a completed packet with the Project Officer. Table 4 below outlines more information about how we will incorporate the materials.

Table 4: Materials, Curricula and Presentations

Title	Duration	Type	Audience	Goals
Energy-VERY Big Picture	20 to 90 minutes	Presentation, demo, workshop	General Public, Media, Educators, public officials	awareness of planetary and regional energy issues; understanding of basics
Transportation and Energy-the Big Picture	20 to 45 min	Presentation, discussion, demos	Drivers, Fleets, Media, Educators, Public officials	Awareness of Transportation fuel issues
From Petroleum to Biofuels	45 minutes	Presentation, discussion, demos	Drivers, Fleets, Media, Educators, Public officials	Awareness of Transportation fuel issues; personal action
Action Now: Idle Reduction – Efficiency and CNG - Propane	45 minutes	Presentation, discussion; based on current UCCC activities	Drivers and Fleets	Personal empowerment, action
Action Now and Later: Biodiesel, Bio-alcohols, and other biofuels	45 minutes	Presentation, discussion	All audiences	Personal action—expectation of near future choices
Fueling Sustainable Futures: Clean Cities Curriculum	Two, 2 hour workshop sessions	Presentation, demo, workshop, discussion	Clean Cities Coordinators, staff, and regional collaborators and guests	Train trainers; disseminate FSF materials; utilize augmented CCC Curriculum
Driver Education Curricula	1-3 hours	Materials for existing curricula, text books	Driver education students and teachers	personal action—efficient driving skills
Truck Driver Curricula	1-3 hours	Materials for existing curricula, text books	Truck driver education students and teachers	personal action—efficient driving skills
Middle/Jr High School STEM	1 – 10 hours	Demos and labs	Middle/Junior High students, parents, teachers	Connect to STEM, environmental education

High School Chem, STEM	1 – 10 hours	Demos and labs	High school students, parents, teachers	Connect to STEM, driver education, environmental education

Energy - the Very BIG Picture is a discussion-based, partially interactive presentation/workshop which can range from about 20 minutes to up to 2 hours (URL 8). The workshop is based in part on the National Academy of Sciences booklet: What you need to know about ENERGY (URL 9), but more visual, updated, and more individually and personally relevant. We will offer PowerPoint, pdf, and web versions, together with appropriate short handouts. Many of these events will use USC's unique Magic Planet spherical projection system (URL 10), providing a dynamic whole Earth, planetary view and experience of climate change, CO2 levels and time course, and energy use comparisons by country and region.

Transportation and Energy – The Big Picture is similar, but designed for a 20 to 45 minutes presentation and discussion. The presentation and materials will fully cover Action Now, Now and Later, and Action Tomorrow perspectives – with the goal of personal motivation and action.

From Petroleum to Biofuels: Combustion, CO2, Sustainability, and Climate Action is for audiences which already are familiar with the Big Picture perspectives; this topic goes into more detail on combustion, CO2 generation and effects, climate change and global warming, petroleum resources, bio-generated fuels/sources, and other issues. Topics include energy geography, security, sustainability, and safety. Designed for a 45 minute presentation, the materials include some hands on activities and an extensive web presence and follow-up process.

Action Now: Idle Reduction – Efficiency and CNG - Propane is a focused 30 to 45 minute presentation presenting the power and efficacy of efficient driving and idle reduction and presenting the background, advantages, and issues related to natural gas and CNG conversion and implementation. We will also develop these as separate, even more targeted, presentations. The materials include some hands-on activities and an extensive web presence and follow-up process.

Action Now and Later: Biodiesel, Bio-alcohols, and other biofuels, including those from algae and engineered organisms, covers the current status and regional availability of biofuels, with a focus on biodiesel. This presentation includes hands-on demos related to diesel and biodiesel properties and characteristics. We will also include an introduction to current R and D efforts related to algae-derived biofuels, the Freeway to Fuels programs, and related projects. The goal here is to encourage, and even expect as well as respect, innovation and development. This area will require nearly constant updating. The materials include some hands-on activities and an extensive web presence and follow-up process.

Fueling Sustainable Futures: An Expanded Clean Cities Curriculum is a 4 hour session for Clean Cities national regions which incorporates most of the shorter presentations, demonstrations, and workshops we will develop in this project. Working closely with regional CCC Coordinators/hosts, we will strive to include the same mix of expanded audiences represented in Table 2, but appropriate to the specific needs of the CCC region in which the activity is scheduled. The materials include some hands-on activities and an extensive web presence and follow-up process.

Driver Education Curricula relates to the development of materials and activities appropriate for inclusion in standard high school driver education curricula, manuals, and textbooks. We will also

work with the Utah State Driver License Division to incorporate appropriate material in the Utah Driver Handbook; this Handbook is revised annually. Beginning with the USOE and several Utah school districts in Year I, these materials will be quickly expanded via CCC Regional Coordinators to school districts and Driver License groups across the country—as well as most Utah school districts in Year II. The goal is for the new generation of drivers to be aware, knowledgeable, and responsive to the objectives of CCC and this FSF project.

Commercial Driver Curricula relates to developing materials and curricula for use in special Truck Driving courses and programs, often offered via local community colleges, such as SLCC, to facilitate the acquisition of a Commercial Driver License. We plan to work with the American Trucking Association, which has an aggressive program for idle reduction, efficient shifting and driving; it advocates for reduced speed limits to enhance fuel efficiency. We are working with Utah's Driver License Division to include these materials in the Commercial Driver License Handbook, revised annually. One of our collaborators is the SLCC Truck Driver Program. We expect to include our materials in the various textbooks and manuals used in these certification training programs.

Middle/Junior High STEM Curricula refers to the work of consultants Richerson and Edwardson as well as our ongoing Leonardo on Wheels-Science (LOW-S) traveling, hands-on program. LOW-S visits 30 schools and regions of Utah every year, delivering hands on STEM activities to over 12,000 students and to thousands more via community nights and related events (URL 11). Beginning in the Fall 2009, LOW-S will feature a biodiesel-fueled truck and a set of hands on activities related to biodiesel, biofuels, and algae, as well as efficiency and idle reduction.

High School STEM, especially chemistry refers to the work of consultant Pickelner, our high school driver education activities and materials, and the integration of STEM activities via the FSF subjects.

We will make all of these courses, curricula, workshops, and related materials freely available and accessible via the project web-site (URL 12). The project staff will also regularly update the project's progress, provide follow-up, and utilize it for assessment and evaluation.

Exhibits and Flexhibits: a particular USC strength is the development and application of very hands-on, highly interactive, motivating activities. Although this interest and experience is based on our successful Leonardo on Wheels – Science traveling science program, we have carried this concept over into our diverse community events and workshops. FSF provides a unique challenge for hands-on, interactive workshops. In this project, we can not take our 25 ft trailer, and 10 – 15 carts containing exhibits to the NE or SE CCC region, for example. But, we can take our unique Flexhibits anywhere we can take a small suitcase. An experienced, well informed, confident, and outgoing presenter can easily work with Flexhibits and related materials to provide a motivating, effective, facilitated, hands-on experience.

5. The Strategy/Plan to Deliver the Information via Workshops in Diverse Geographic Areas

We will communicate the goals, objectives, desired audiences, reasonable schedule and workshop format clearly to the Regional CCC Coordinators and workshop hosts through *Introduction to FSF Workshop* packets. These may include video clips that they can share with the workshop hosts to understand the format better.

The FSF project staff will research each region's transportation issues and collaborate with Regional Coordinators to ensure that the workshops address the specific needs of that area.

6. A Description of the Metrics and Milestones for Assessing Workshop Effectiveness
The project's first major metric is the number of people attending the targeted workshops and community events. The second metric is the assessment of the workshops, and the use of web activities. The third is the follow-up work we will conduct to determine if: a) more training needs to occur; and b) behavior related to fuel use and efficiency has changed due to the workshops.

Some of the project's milestones include: generating scientifically sound curricula and materials; developing formats for workshops and community events; scheduling workshops and community events for both phases of the project; arranging staff for each presentation; conducting DOE briefings for both phases; constructing the evaluation plan; presenting at least two workshops in each region over the two year project period; and summarizing and disseminating the results on our websites, in newsletters and scholarly journals, through the media, and at professional conferences.

Clarity, Completeness and Adequacy of the Detailed Description of the Project Work
This proposal clearly and concisely outlines the project description, the scope of work that USC, UCCC and their collaborators will perform along with the milestones to ensure its successful completion, the expertise and qualifications of key personnel, the partners' commitments, and a reasonable budget.

FSF ideally matches and expands/enhances the existing activities of USC and UCCC. It allows considerable synergism with and efficiency among our various programs. Energy is a very major theme and focus of USC. The activities and topics proposed for FSF mesh with our existing activities extremely well and enlarge our future plans. USC's skills in informal, hands-on activities and education complement UCCC's experience and activities in workshops and related presentations. Our two networks of people and providers have, until this project, been largely different, but will now coordinate and collaborate. Our staffs and collaborators are deeply committed to the subjects and the issues as are our volunteers.

Adequacy and Appropriateness of the Schedule, Including the Duration and Sequencing of Tasks and the Scheduling of Milestones
Much of the project preparation work is already underway. Andrade has collected significant information about curricula related to transportation fuels and USC staff has requested Regional CCC Coordinators to share examples of evaluation techniques. The partners, consultants, collaborators and advisory board member have all agreed to work on FSF and look forward to their involvement. The current USC staff is experienced with science-based, hands-on, interactive presentations; the workshops will continue this format of audience engagement. Erickson has worked hard to line up Regional CCC Coordinators who will actively recruit workshop hosts and attendees in their areas. All of this groundwork will expedite the implementation and continuation of the project.

Effectiveness of Proposed Marketing Plan
Our marketing plan is a two pronged approach. First, we intend to utilize media resources to inform audiences about workshops through PSAs, press releases, articles, and interviews, and to generate interest via the web/Internet. Second, our Media Awareness and Involvement Plan (MAIP) is meant to recruit media representatives as workshop participants as well as provide them with scientifically sound fact sheets and data.

USC recently initiated a pr/media/marketing plan to attract potential participants to our events and workshops. As a result, a few weeks ago 350 people attended a Community Night connected to a Leonardo On Wheels-Science visit. In the past, usually only 30 – 50 have come. This is a strong

indicator that our concentrated efforts to reach media does work and will support the success of the project.

Demonstration That the Project Will Lead to Market Transformation

Fueling Sustainable Futures will lead to increased alternative and renewal fuel use through cogent, well constructed workshops and accompanying materials that lay out the science behind the popular debates and motivate participants through direct, hands-on experiences. Second, this proposal contains a methodical plan for our Clean Cities Coalition collaborators to follow-up with workshop participants. The purposes of this step are to determine if additional training is necessary and if any positive changes in behavior have occurred as a result of the workshops. We will utilize surveys developed as part of the evaluation plan in this part of the project and incorporate the web site as an assessment tool. It will provide mechanisms and incentives for our workshop participants to provide input and critique on a regular basis.

Adequacy and Effectiveness of the Media Outreach Plan

Media are critical to the success of the project both as participants in workshops and events, and as contributors to the larger community about the facts of alternative and renewable fuels. We will invite print, radio and television media representatives to join in the workshops, not merely observe them; distribute PSAs to media outlets, including community newsletters; meet with media personnel to discuss the concepts underpinning the interactive science and technology exhibits; and present information on the USC and UCCC websites geared toward the media.

Criteria 3: **Project Reach/Potential & Concept**

The Extent to Which the Project Effectively Reaches a Significant Number of Target Audiences

We expect to reach up to 800 targeted audience members through the workshops and to impact approximately 100,000 in Phase/Year I with community events, media outreach, the web/Internet and train the trainers amplification. In Phase/Year II, this will expand to up another 100,000 people by using the same or similar methods.

The Ability to Hold at Least One On-site Workshop Per Region Per Year

USC visits 30 schools annually statewide with the Leonardo On Wheels-Science (LOW-S) mobile science center and education outreach program. Each visit at a junior high or middle school lasts for 3 – 5 days and almost every school holds a Community Night for families, neighbors and community officials. These trips involve hauling 12 – 15 interactive science exhibits via truck and 25' trailer, unloading the exhibits and setting them up, meeting with teachers and principals, guiding students through the program during each of the school's science periods, co-hosting the Community Night, loading the trailer at the end of the week, and driving back to the Salt Lake City headquarters before the next visit. A core group of three people, two educators and the Community Program Implementor/educator, rotate the LOW-S duties and are involved with this project. These experiences alone have contributed to an infrastructure that permits the flexibility to set up programs across a wide geographic range to a diversity of audiences and interests.

Additionally, Andrade began holding interactive workshops on energy last fall, with the possible expansion this summer into Southern Idaho and Western Colorado. His most recent audiences included middle school science teachers at the Utah Science Teachers Association Conference and 4^{th} – 6^{th} grade hearing impaired students, who were as engaged as any group of young people.

Erickson and UCCC similarly have a long history of presenting workshops and working with national groups.

The Extent to Which the Project Covers the Area of Interest and the Subtopics
USC and UCCC will address each subtopic (biodiesel and biofuels, ethanol and other alcohols, natural gas & propane, and fuel economy & idle reduction) thoroughly through a series of workshops, community events, competitions, media articles/interviews and information on their respective websites. We will likely mix and match the topics to address that audience's needs. Specifically, the workshop contents will focus on (please see more detail on pages 15 - 16):

1. *Energy - the Very BIG Picture;*
2. *Transportation and Energy – The Big Picture*;
3. *From Petroleum to Biofuels: Combustion, CO2, Sustainability, and Climate;*
4. *Action Now: Idle Reduction – Efficiency and CNG – Propane*;
5. *Action Now and Later: Biodiesel, Bio-alcohols, and other biofuels, including those from algae and engineered organisms;* and
6. *Fueling Sustainable Futures: An Expanded Clean Cities Curriculum*

We will also include information on the governmental initiatives from the respective states. For example, Salt Lake City and Salt Lake County mayors, and Utah's governor all support clean air and renewable fuel policies (URL 13).

The Extent to Which the Project Includes an Online or Internet Component that Allows Participants to Access the Curriculum Remotely or Through Webinars/Video Conferencing
We are committed to developing a highly interactive, easy to access and user friendly site with which to communicate and interact with our audiences and collaborators. We plan to use the ManyOne (URL 14) new free platform, which makes possible the Digital Universe, a free and open site for highly current and credible information (URL 15). Our web site developer and implementer, Mike Davie, recently redesigned our existing site (URL 1) and continues to make it more interactive and responsive. We are building an on-line assessment capability for our current, on going programs, especially Leo on Wheels – Science. We are including more animations and simulations on the site to augment our hands-on, physical exhibits and activities. We will use the many tools available on the manyone.net platform as appropriate.

We have reserved a FSF project domain name (URL 12) to use and link to. The site will include open access to all our curricula and presentation materials, links to additional information and resources, and the opportunity for users to provide input, feedback, and assessment. We will include an interactive map to highlight the six Clean Cities Coalition regions, and note past and future workshop schedules, updated curricula materials and so forth. An interactive map currently exists at our Leonardo on Wheels site (URL 16) to highlight the program's visits across the state.

FSF will also include web hits and blogs as part of the evaluation process and rely on videoconferencing for meeting with the National Advisory Board members.

Inclusion of a Training Evaluation Mechanism to Measure the Effectiveness of the Training and to Determine the Need for Follow-up
We have budgeted an evaluation process in both years of the project. It will assess the participants' knowledge levels and behavioral changes, and the project's ability to meet stated milestones. We have already begun to gather information from the Regional CCCs about their assessment tools so that we can utilize these pieces. Additionally, we will rely on suggestions gleaned from the National Science Foundation, the NIH Science Education Partners Award, and the NSF Center for Advancement of Informal Science (URL 17). We anticipate having the evaluation plan developed by August 31, 2009.

The project coordinator will oversee the regular collection of project related data and match these against the stated milestones. This includes tracking the workshop attendees both to ensure Continuing

Education credits for those who want them and to offer follow-up training. The quarterly reports to the DOE Project Officer will reflect this information along with the project's overall progress.

We will collect participant data after every workshop and begin compiling these immediately. In addition to the traditional pre/post written surveys, we will employ the website as an assessment tool to generate information about the participants' attitudes, behaviors and content retention, and to collect their comments and critiques. This is not just during and immediately after the event, but at 6 and 12 month intervals later. We intend to develop a means to request input regularly. The goal is more than assessment only, it is also to keep our expanding audience connected with us so that we can continue to provide them with reinforcement, information, and motivation while they continue to contribute input, critique, and perspective.

The evaluation plan will include:

1. formative information, beginning at the start of the project and continuing throughout to ensure that our milestones still correspond to the project purpose, that we meet these, and that we stay within budget constraints;
2. participant surveys to determine initially their level of knowledge and then both their awareness and the changed attitude/behavior post workshops. We will follow-up a year later to see if the original excitement generated has translated into real behavioral changes, such as the use of nonpetroleum fuels in fleet cars;
3. website and dissemination feedback. Website hits will indicate the general continuing interest following participation in an event; and
4. summative data to review and draw conclusions at the end of Phase I and Phase II with an overall final analysis of the entire project. We will use the information after year one to revise the project if necessary, including the possibility of revisiting some sites for additional training.

The Ability for Workshop Attendees and/or Training to Earn Continuing Education Credit
Attendees can earn Continuing Education Credits both through the Salt Lake Community College and the Utah State Office of Education. We will include this information in the Introduction to Workshop Packets for workshop hosts and post it on the website along with applications for participants. The project coordinator will work with Regional CCC Coordinators to ensure professional accreditation in each of their states for attendees.

Reasonableness of the Cost Effectiveness of the Project
The total proposed budget is $577,041. Based on a Phase l budget of $295,512, and $281,521 in Phase ll, it will cost $49,252 per workshop (six total) in the first year and $28,152 the second (ten total). When considered per participant trained, the costs lower to $985 during year one and $563 in year two. However, these are just the attendees at the formal workshops and does not include the several hundred expected at community events, the professionals trained by newly trained attendees, or the visitors to the website. We anticipate 100,000 people impacted by this project in Phase/Year 1 and another 200,000 in Phase/Year ll. Please see Table 4, pages 14 -15 for a full description of all the programs in this project.

Relevance and Outcome Impacts
This project, Fueling Sustainable Futures (FSF): Pathways to Foster Awareness, Understanding and Action**,** will meet the objectives of the program announcement by producing a greater understanding of alternative and renewable fuels and motivating targeted audiences to change their transportation fuel behaviors. These will result from:

- informal education methods that incorporate hands-on experiences, website interactions, factual science-based materials, competitions and contests;

- follow-up conversations with the initial workshop educators to determine if more information is needed;
- opportunities to learn from each other, including training the trainers sessions, across the national Clean Cities Coalition.

The FSF Project builds on USC's and UCCC's experience with many diverse audiences, ranging from junior high students anticipating being able to drive to experienced truck drivers and fleet managers. USC's community events attract many varied audiences, including older adults. USC's career information programs (in partnership with the State's Dept. of Work Force Services) focuses on ages 18 and up, including adults who need re-training and new skills for new employment. This is why we have several different presentations, workshops, and curricula (Table 4, pages 14 - 15). Different audiences have divergent needs and interests.

All our presentations have a 'train the trainers' approach. The basic idea and expectation is that all who participate are expected to transmit their enthusiasm, commitment, and information to their own networks of associates, both personal and professional. Our approach has a rippling effect; we conduct outreach to targeted audiences who, in turn, connect to a new and larger number of people and so on across the region. We will develop means on the FSF web site to facilitate the creation and use of such networking activities. The basic amplification process we will utilize is shown in Figure 3 (page 13).

Our proposal coincides not only with the Department of Energy's interest in changing transportation fuel use nationally, but with state, regional and local efforts, too. Utah Governor Jon Huntsman, Salt Lake City Mayor Ralph Becker, and Salt Lake County Mayor Peter Corroon have all issued initiatives to reduce our petroleum dependence via efficient driving, public transit and the use of alternative and renewable fuels while improving the air quality along the Wasatch Mountain Front, the 120 mile heavily metropolitan area of Utah. UCCC has actively held workshops throughout the state to address the need to switch to alternative and renewable transportation fuels and collaborated with its counterparts within the region.

Utah is a center of technology and research activity. Utah Science Technology And Research (USTAR) is a combined research and entrepreneurship program funded by state dollars to spin off small businesses based on innovations in science and technology. These contribute to the state's knowledge in a variety of topics (genetics, bioengineering, agriculture for example) and to its economic well-being. Utah State University (USU) and the University of Utah (UU) are the two incubator sites that actively recruit researchers and faculty members nationally and internationally to work on their interests in modern labs.

USC and UCCC combine all these elements in this proposal with the explicit purpose of enlightening a generation of fleet managers, drivers, educators and the media as well as the general public about alternative and renewable transportation fuels. These are the people who can create changes through: switching to newer fleet cars that use nonpetroleum fuels, teaching high school and commercial truck driving students about fuel economy and idling, and informing others about the myths and facts of transportation fuels.

We anticipate the following outcomes:

1. Sixteen (16) workshops held during the project: six (6) in each CCC region in Phase/Year I, ten (10) in Phase/Year II (six in each region, four additional in the Northwest Region);
2. Up to 800 trainers trained through the workshops;
3. Up to 100,000 people impacted through the workshops, community events and the interactive website in Phase/Year I;

4. Up to another 100,000 people impacted through the workshops, community events and the interactive website in Phase/Year II;
5. Curricula developed on alternative and renewable transportation fuels that are utilized in workshops and community events, placed on the web, and incorporated into education manuals for adults, students, and fleet drivers;
6. Interactive exhibits developed to engage and motivate participants during workshops and community events, including after the project is completed;
7. Interactive website created, implemented and with plans for its continuity after the project ends;
8. A science-based, interactive replicable model of informal education on alternative and renewable transportation fuels;
9. Longitudinal data generated reflecting changes in behavior regarding transportation fuels usage; and
10. Results disseminated locally, regionally and nationally.

Role of Participants

The project is a collaborative effort between the Utah Science Center and the Utah Clean Cities Coalition. Joe Andrade, USC Director is the Principal Investigator and USC is the lead agency. USC's role is to:

1. manage the project including assigning staff, meeting milestones, establishing the workshop/events/competitions, creating its own website presence linked to UCCC and the partners, following the budget items; and developing a thorough media outreach plan;
2. collaborate with UCCC and the other partners to design cogent, factual materials;
3. detail and institute the evaluation process, including survey design and development;
4. oversee the reports for the required detailed briefings with the Project Officer;
5. follow up with participants to determine the training results; and
6. disseminate the results.

UCCC's role includes:

1. collaborate with its Clean Cities Coalition counterparts to determine workshop sites and dates, audience recruitment, and media participation;
2. work with USC and the other partners to design cogent, factual materials;
3. maintain the relationship with the Project Officer and assist with the detailed briefings;
4. create its own website presence linked to the USC site and the partners; and
5. disseminate the results.

Principal Investigator

Joseph Andrade, Ph.D., Director of the Utah Science Center, is the sole principal investigator.

Facilities and Other Resources

The FSF project has office facilities at 120 So Main St., Salt Lake City; and an exhibit development and repair shop at 1400 W Goodwin Ave., Salt Lake City, within the Salt Lake City School District's Center for Science Education. The shop is equipped with appropriate tools and facilities for exhibit prototyping, repair, and maintenance. Larger jobs are done via local commercial shops and vendors. In addition to cart-mounted exhibits, USC develops Flexhibits suitable for community events and workshops. The interactives used in this project for courses and workshops will generally be of the Flexhibit variety, allowing for convenient travel and setup anywhere.

USC has a 2003 Ford F250 diesel truck which will serve as an 'exhibit' related to biodiesel utilization. The truck is normally used to pull the Leo on Wheels – Science colorful, 25 ft trailer, throughout the state and region.

Equipment

We will not purchase any equipment for this project.

Bibliography

1. Adams, A. Tractor-Trailer Driver: Handbook/Workbook (3rd Edition). Thomson
2. Delmar Learning. Boyle, G. (Ed.). Renewable Energy: Power for a Sustainable Future (2nd Edition). The Oxford University Press. 1996.
3. Demirbas, A. Biodiesel: A Realistic Fuel alternative for Diesel Engines. Springer. 2008
4. Drapcho, C.M., Nghiem, P. N.. Walker, T.H. Biofuels Engineering Process Technology. McGraw-Hill. 2008.
5. Early, J., McKeown, A. *Smart Choices for Biofuels.* Report to the Worldwatch Institute and the Sierra Club. January 2009.
6. Friedman, A. (Ed.). (March 12, 2008). Framework for Evaluating Impacts of Informal Science Education Projects [On-line]. (URL 15).
7. Graves, B. *Strategies for Reducing The Trucking Industry's Carbon Footprint.* American Trucking Association.
8. Johnson, M.L., Crabb, O., Opfer, A. A., Thiel, R. R., Mottola, F. Drive Right. You Are the Driver (10th Edition). Prentice-Hall. 2007.
9. Keller, J.J. Tractor-Trailer Driver Training Manual (2nd Edition). J.J. Keller & Associates, Inc. May 2008.
10. Kemp, W. H. The Renewable Energy Handbook. Aztext Press. 2005.
11. Klag, P. *Fueling the Future.* National Energy Foundation. 2002.
12. Pahl, G. Biodiesel: Growing a New Energy Economy (2nd Edition). Chelsea Green Publishing. 2005.
13. Rapier, R. *Renewable Diesel* in Pimental, D. (Ed.). Biofuels, Solar and Wind as Renewable Energy Systems: Benefits and Risks. Springer. 2008
14. Sims, R. E., El Bassam, N. *Biomass and Resources* in Bioenergy Options for a Cleaner Environment in Developed and Developing Countries. Sims, R. E. (Ed.). Elsevier. 2004.
15. Sims, R. E., Taylor, M., Saddler, J., Mabee, W. *From 1st to 2nd Generation Biofuel Technologies: An Overview of Current Industry and RD & D Activities.* International Energy Agency. November 2008.
16. Song, C., Hsu, C. S., Mochida, I. Chemistry of Diesel Fuels. Taylor & Francis. 2000.
17. Ucko, D. A. Evaluation in Informal Science Education (ISE). National Science Foundation. October 20, 2006.
18. U.S Department of Energy, *Clean Cities FY09 Petroleum, Funding # DE-PS26-09NT01236-00*. December 11, 2009:11.
19. Westat, J F. The 2002 User Friendly Handbook for Project Evaluation, Prepared under Contract REC 99-12175 for The National Science Foundation, January 2002.
20. _____. Bumper to Bumper: The Complete guide to Tractor-Trailer Operations. Mike Byrnes and Associates, Inc. 2003.
21. _____. *Driver Education for Utah High Schools: Organization, Administration, and Standards*. Utah State Office of Education. December 2006.
22. _____. *Utah Commercial Driver License Handbook.* Utah State Department of Public Safety. October 2007.
23. _____. *Utah Driver Handbook.* Utah Department of Public Safety. August 2007.

Statement of Project Objectives

Project Title: Fueling Sustainable Futures (FSF): Pathways to Foster Awareness, Understanding and Action

A. Objectives

The overall objective is to develop and provide resources and processes by which to motivate, involve, inform, and activate a wide range of audiences and the general public on the need and opportunities to reduce the use of and the reliance on fossil – derived petroleum fuels. We will address topics in a set of presentations, workshops, and community events ranging from general to the highly focused:

- Energy: The Very BIG Picture
- Transportation and Energy: The Big Picture
- From Petroleum to Biofuels: Combustion, CO2, Sustainability, Climate Action
- Action Now: Idle Reduction, Efficiency and CNG, Propane
- Action Now and Later: Biodiesel, Bio-alcohols, and Other Biofuels—including those from algae and engineered organisms

Objective 1: Research, develop, and fine-tune audience-targeted curricula, workshops, and activities in the topics related to the DOE RFP.

Objective 2: Present and implement these resources and materials, including activities to train the trainer, with collaborating Clean Cities Coalition Coordinators in all six regions nationally, their audiences, the media and the general public via a wide range of events.

Objective 3: Disseminate the project nationally via our National and Regional Advisory Boards, the web/Internet, the media, newsletters and other publications, and professional/national meetings and conferences.

B. Scope of Work

Phase/Year I

1. Create science-based alternative and renewable fuels, and fuel efficiency workshops, curricula, and media materials after thorough research and review of current information;
2. Work closely with CCC Coordinators in each of the six regions, determine workshop and community events sites and schedules for the first year, and assign staff to the workshops, and hire and train needed new staff;
3. Involve and utilize the National and Regional Advisory Boards to establish roles and meeting schedules and provide input and advice;
4. Design and implement a project evaluation component; collect and analyze data from participants, use these as basis for project review and possible revisions;
5. Generate specific media packets and conduct outreach to media representatives; and
6. Brief DOE personnel and seek their input on project design and status.

Phase/Year II

1. Evaluate and revise project
1. Offer a total of 10 workshops during the second year of the project;
2. Update materials and continue evaluation process;
3. Disseminate results regionally and nationally;
4. Make all materials and results available on our unique, interactive web-site; and
5. Brief DOE personnel and seek their input.

C. Tasks to be Performed

Objective 1: Research, develop, and fine-tune audience-targeted curricula, workshops, and activities in alternative and renewable fuels, fuel economy, and idle reduction.

The project will include interactive, hands-on workshops ranging from 20 minutes to 2 hours for targeted audiences, including fleet managers, fleet drivers, driver education teachers, students, and the media. We

will engage the general public through interactive, hands-on community events. Additionally, an interactive and visual website and media stories will help clarify and expand these topics during the two year project.

Task 1.0: Project Management and Planning
The Project Management Plan (PMP) provides the specific steps and plan for the project's successful completion. As soon as possible, we will meet and discuss with all consultants and collaborators, as well as the advisory boards, to update and modify the PMP as needed, thus ensuring that all partners and collaborators are clear about expectations and plans for input and outcomes. We will revise the Plan to include details based on negotiations with the Department of Energy.
Timeline: This process will take place during the first two weeks of July 2009, or the two weeks following formal notice of grant award.
Deliverable: Cogent plan to guide the project through its two year duration, including specific milestones, deliverables, marketing, budgeting, decision points, and risk management.

Task 2.0: National and Regional Advisory Boards
These groups will advise USC and UCCC on project plans and directions, suggest local, regional and national applications for the project, and generally lend their knowledge and networks as needed about alternative and renewable fuels, and fuel economy and idle reduction. We have compiled a list of distinguished members willing to serve on each group (Table 1, page 5). We anticipate semiannual meetings with the Regional Advisory Board and video conferencing with the National Advisory Board.
Timeline: July – August, 2009 and then ongoing.
Deliverable: Formal establishment of Boards; Board review of materials and on-going advice.

Task 3.0: Develop subjects, content, and materials for the audience-targeted curricula, workshops, and activities.
USC and UCCC will work with its consultant educators and collaborators to compile and review the most current information on biodiesel and related biofuels, ethanol and other alcohols, and natural gas and propane to create current science-based materials and curricula. We will follow the same process for fuel economy and idle reduction. Our existing materials, curricula, and experience provide a strong foundation for this work.
Timeline: July – September, 2009 or the 3 months following formal notice of grant award.
Deliverables: Complete outlines, materials, and resources for each of the 5 audience – targeted presentations and activities:

Energy - the Very BIG Picture (available July 2009);
Transportation and Energy – The Big Picture (August 2009);
From Petroleum to Biofuels: Combustion, CO2, Sustainability,
Climate Action (August 2009);
Action Now: Idle Reduction – Efficiency and CNG – Propane (July 2009);
Action Now and Later: Biodiesel, Bio-alcohols, and other biofuels -
including those from algae and engineered organisms (Sept. 2009).

Task 4.0: Department of Energy Project Officer Briefings
We will present the project plan and design within 60 days of the grant award for final review and input prior to implementing the project fully. The DOE Project Officer will receive the curriculum materials prior to this briefing meeting. During a second briefing at the end of the first year we will present information on the project's activities, successes and challenges.
Timeline: September 2009, May 2010
Deliverables: 1) in person briefings with Project Officer; and 2) written progress reports describing the project design, its status, and costs incurred.

Objective 2: Present and implement these resources and materials, including activities to train the trainer, with collaborating Clean Cities Coalition Coordinators in all six regions nationally, their audiences, the general public via a wide range of events, and the media.

Task 1.0: Program and Event Scheduling.
Determine workshop and community events sites and schedules for the first year. Our Community Program Implementor will work with staff and collaborators to establish a schedule of workshops, courses, and community events for Phase/Year I.
Timeline: October 31, 2009
Deliverable: Fully implementable schedule of workshops and events.

Task 2.0: Acquire, train, and assign staff. USC and UCCC will augment existing staff with part-time staff, volunteers, and staff provided by the project collaborators.
Timeline: Beginning December 2009 and continuing as needed throughout the project.
Deliverable: Full contingent of knowledgeable staff available to facilitate workshops and events.

Task 3.0: Develop interactive website with links to project partners and collaborators.
We will work with the web design consultant to create a specific site for interactive experiences, blogs and links to further information related to alternative and renewable fuels, fuel economy and idle reduction.
Timeline: Sept. 2009
Deliverable: interactive websites initiated that provide information for the public and targeted audience members.

Task 4.0: Create and develop a Media Awareness and Involvement Plan (MAIP) and develop and distribute media packets with clear, concise fact sheets useful for all of the media. Invite media representatives from print, radio and television to participate in workshops where they can absorb the education objectives through hands-on activities and interaction with their fellow attendees. USC has a detailed media list with contact information that we will use for this task, and we will ask the other 5 regions to utilize a similar approach when recruiting audiences for their workshops.
Timeline: We will begin this process within the first month of the project and continue it throughout the project's two years.
Deliverables: 1) packets produced containing fact sheets, video and audio clips, and PSAs developed for media representatives; and 2) media actively collaborate in presenting science-based factual information about alternative and renewable fuels, fuel economy and idling reduction.

Task 5.0: Formulate and implement evaluation plan
The Project Coordinator will oversee the creation of the evaluation plan based on drafts drawn up by USC and UCCC staff. We will rely on Regional CCC Coordinators, National and Regional Advisory Board members, and information from the National Science Foundation and the National Institutes of Health to provide direction for a well conceived evaluation component. We will collect surveys at the end of each workshop, analyze the data as the project progresses, and compile the results to use for review and possible project revisions. A web-based assessment is also a strong component of the evaluation plan.
Timeline: August 31**,** 2009 to complete and implement the evaluation plan; the evaluation will continue throughout the project.
Deliverable: Progress and summative data elicited and compiled throughout project, and included in DOE reports.

Task 6.0: Expand the program to ten (10) workshops in Phase II
We will continue to offer one workshop in all six (6) regions in the second year and add another four (4) in the Northwest Clean Cities Coalition Region that will include Colorado, Idaho, Oregon, Wyoming, Utah, and Washington.

Subtask 6.1: Update materials by asking the project collaborators, partners and advisory board members to review the current curricula and making suggestions.
Timeline: July 2010
Deliverable: Revised and relevant curricula materials.

Subtask 6.2: Continue evaluation process
The Project Coordinator, in conjunction with the advisory boards and project staff will review the outcomes from the first year to determine any necessary changes in materials, workshop format, audience recruitment, media involvement and other critical issues and suggest changes to consider for the beginning of the second year. S/he will implement the changes based on input from the advisory boards and the staff, and continue the evaluation process.
Timeline: July 2010
Deliverable: if needed, a revised project.

Subtask 6.3: Update the website, workshops, materials, and curricula regularly
The science, technology, and perspectives in the energy and biofuels areas will change very rapidly in the near future. We will update our web site very regularly, and, of course, the workshop and related presentations, to reflect the most current and appropriate data, practices, and perspectives. By inference, the enhanced Clean Cities Curriculum is, indeed, a very dynamic curriculum. We are fully prepared to update, improve, and change as needed and appropriate.
Timeline: March 2010 – on-going
Deliverable: Revamped website and materials

Objective 3: Disseminate the project nationally via our National Advisory Board, the web/Internet, newsletters and other publications, and national meetings and conferences.

Task 1: Disseminate results
USC, UCCC and their collaborators will disseminate the results through websites, professional journals and conferences, newsletters, media publications or stories, and related programs.
Timeline: Phase I: June 30, 2010; Phase II: up to six months after the end of the program.
Deliverables: 1) information shared nationally; and 2) project replicated in other Clean Cities Coalition regions.

D. Critical Path Project Milestones
Our major critical path project milestones include, but are not necessarily limited to:

Item	Date
• Project Management Plan	July 2009
• Curriculum and materials research	September 2009
• Website launch	September 2009
• Brief DOE personnel about project design	September 2009
• Interactive exhibits developed	November 2009
• Revamp website	March 2010
• Brief DOE personnel at end of first year	May 2010

- Conduct and complete six (6) workshops — June 2010
- Compile and analyze evaluation data — June 2010
- Interim results disseminated — June 2010
- Revise project as needed — July 2010
- Expand project an additional ten workshops — July 2010
- Post-project Web Continuity Implemented — April 2011
- Project final report submitted — June 2011
- Compile and analyze final evaluation data — June 2011
- Disseminate final results — July – Dec. 2011

The milestone log and the timeline in the Project Management Plan both contain more detail about the exact markers we will meet throughout the project.

E. Deliverables

In addition to the ones listed with each task and subtask, our deliverables include:

- A suite of workshops at different levels for targeted audiences (Action Now, Action Now and More Later, and Action After Some R & D), and another set for the general public (Energy: The Very BIG Picture, Transportation and Energy: The Big Picture, and From Petroleum to Biofuels: Combustion, CO2, Sustainability and Climate Action);
- Interactive, hands-on exhibits, models, and simulations;
- Curricula and materials developed for fleet managers, fleet drivers, driver education teachers and students;
- Information about fuel efficiency and idle reduction placed in driver handbooks geared to the general public, truck drivers and others;
- All of the above integrated to initiate a Clean Cities Learning Program that is replicable regionally and nationally.

F. Briefings/Technical Presentations

The project partners have included periodic briefings with DOE personnel in our milestones and budgeted the expenses of travel to the Project Officer's facility.

Abbreviations

ATA = American Trucking Association
BD=Biodiesel
CCC= Clean Cities Coalition
CNG= Compressed Natural Gas
INL = Idaho National Laboratory
IR= Idle Reduction
NEF = National Energy Foundation
NIDB = National Institute for Driver
NREL = National Renewable Energy Lab
RFP = Request for Proposal
SLCC= Salt Lake Community College
SLC = Salt Lake City
STEM= Science, Technology, Engineering, Mathematics
UCCC= Utah Clean Cities Coalition
UDOT = Utah Department of Transportation
UDTSEA= Utah Driver Training and Safety Education Association
USEE = Utah Society of Environmental Educators
USC= Utah Science Center
USOE = Utah State Office of Education
USTA = Utah Science Teachers Association
USTAR=Utah Science, Technology, and Research initiative
USU = Utah State University
UTA = Utah Transit Authority
UU = University of Utah

Project URL Sites

1. Utah Science Center, www.utahsciencecenter
2. Utah Clean Cities Coalition Program, www.utahcleancities.org
3. Pickelner, Shey. Figure 1: http://www.plt.org/cms/pages/36_124_156.html.
4. Utah State University and Utah Science Technology And Research (USTAR) http://www.innovationutah.com/
5. Central Utah Biodiesel Project, http://extension.usu.edu/sevier/files/uploads/BioDiesel2-20-07poster%20(2).pdf
6. Utah Public Radio, www.upr.org.
7. Salt Lake Center for Science Education: http://www.slc.k12.ut.us/sites/slcse/.
8. Energy--The Very Big Picture: see a 2 hr version at: http://utahsciencecenter.org/utahsci/community-events/
9. What you need to know about ENERGY: www.nap.edu/catalog.php?record_id=12204
10. Magic Planet: www.globalimagination.org
11. Leonardo on Wheels-Science: www.utahsciencecenter.org/lows.
12. Fueling Sustainable Futures: www.fuelingsustainablefutures.org
13. Salt Lake City Idle Free Program, http://www.idlefree.utah.gov/local_efforts.htm.
14. ManyOne: www.manyone.net.
15. Digital Universe: www.digitaluniverse.net.
.16. Leonardo on Wheels-Science Interactive Map: www.utahsciencecenter.org/lows (click on Where We've Been).
17. Friedman, A. http://insci.org/resources/Eval_Framework.pdf

Project Summary
Project Title: Fueling Sustainable Futures (FSF):
Pathways to Foster Awareness, Understanding and Action

By Utah Science Center (USC) and Utah Clean Cities Coalition (UCCC)
Joseph Andrade, Director USC, PI; Robin Erickson, Director UCCC

Objectives: Building on the experience and strength of an interactive, hands-on, science and technology education program (USC); the experience and effectiveness of UCCC activities and programs; the growing need and interest for information and means for the public to take action, and the need for an expanded Clean Cities Curriculum: we propose to develop and provide awareness and education events, resources, activities, and curricula for a range of audiences and publics on the four specific topics of the RFP's Area of Interest 3: Education and Outreach Workshops for Petroleum Reduction Fuels and Technologies.

Methods:
We will research, develop, implement, assess, fine-tune, and update audience-targeted presentations, curricula, and activities on:

Energy - the Very BIG Picture
Transportation and Energy - The Big Picture
From Petroleum to Biofuels: Combustion, CO2, Sustainability, Climate Action
Action Now: Idle Reduction - Efficiency and CNG - Propane
Action Now and Later: Biodiesel, Bio-alcohols, and other biofuels -
including those from algae and engineered organisms

We will implement these materials and resources in school districts, major fleets, all six (6) CCC regions, the general public, and the media via a wide range of events. All materials will be fully disseminated and made freely available via the web/internet.

Impact: We expect to reach and impact 100,000 people in Year 1 and perhaps up to an additional 100,000 in Year 2 via a peer trainer 'amplification' process and making maximal effective use of the media, national and regional conferences, and the web/internet.

Participants: The lead agency is the Utah Science Center (USC), providing unique, hands-on, highly motivating activities related to science and technology with a focus on energy and the environment. The second partner is the Utah Clean Cities Coalition (UCCC), representing the entire Clean Cities Coalition network. Collaborators include USTAR, a State of Utah advanced University R and D program - with a strong program on biofuels from algae and other biofuels activities, several educator – consultants, fuel distributors, fleet managers, and others. A Regional Advisory Board will provide local and regional advice; a National Advisory Board will provide national perspectives and advice. Both Boards will assist with dissemination.

Submitted 3-30-09 to: U.S. Dept. of Energy; Clean Cities FY09 Petroleum Reduction Technologies Projects for the Transportation Sector; Funding Opportunity Number: DE-PS26-09NT01236-00

Project Management Plan

A. Executive Summary

Objective

The overall objective of the Fueling Sustainable Futures (FSF): Fostering Awareness, Understanding and Action Project is to develop and provide resources and processes by which to motivate, involve, inform, and activate a wide range of audiences and the general public on the need and opportunities to reduce the use of and the reliance on fossil – derived petroleum fuels. A modern, expanded, comprehensive Clean Cities curriculum is a key outcome of the project.

We will address the four specific topics in the Request for Proposal (RFP) Area of Interest 3: Education and Outreach Workshops for Petroleum Reduction Fuels and Technologies through a set of presentations, workshops, and community events. These will range from the general to the highly focused:

- Energy - the Very BIG Picture
- Transportation and Energy – The Big Picture
- From Petroleum to Biofuels: Combustion, CO2, Sustainability, Climate Action
- Action Now: Idle Reduction – Efficiency and CNG - Propane
- Action Now and Later: Biodiesel, Bio-alcohols, and other biofuels - including those from algae and engineered organisms.

Goals

Goal 1: Research, develop, and fine-tune audience-targeted curricula, workshops, and activities in the topics related to the RFP.
Goal 2: Present and implement these resources and materials, including activities to train the trainer, with collaborating Clean Cities Coalition Coordinators in all six regions nationally, their audiences, the media and the general public via a wide range of events.
Goal 3: Disseminate the project nationally via our National and Regional Advisory Boards, the web/Internet, the media, newsletters and other publications, and professional/national meetings and conferences.

Expected Outcomes

1. Sixteen (16) workshops held during the project: six (6) in each CCC region in Phase/Year I, ten (10) in Phase/Year II(six in each region, four additional in the Northwest Region);
2. Up to 800 trainers trained through the workshops;
3. Up to 100,000 people impacted through the workshops, community events and the interactive website by the end of Phase/Year I;
4. Up to 200,000 people impacted through the workshops, community events and the interactive website by the end of Phase/Year II;
5. Curricula developed on alternative and renewable transportation fuels that are utilized in workshops and community events, placed on the web, and incorporated into education manuals for adults, students, and fleet drivers;
6. Interactive exhibits developed to engage and motivate participants during workshops and community events, including after the project is completed;
7. Interactive website created, implemented and with plans for its continuity after the project ends;
8. A science-based, interactive replicable model of informal education on alternative and renewable transportation fuels;
9. Longitudinal data generated reflecting changes in behavior regarding transportation fuels usage; and
10. Results disseminated locally, regionally and nationally.

B. Risk Management

Built into the project are several checks and balances:

- The two partners will confer at least weekly because each provides key resources to ensure the project's implementation and success. This includes apprising the other about the status of partners, consultants, collaborators and Clean Cities Coalition Coordinators;
- A project coordinator hired specifically for the project will oversee the daily operations, meet the milestones and report regularly to the Utah Science Center (USC) and the Utah Clean Cities Coalition (UCCC);
- A project team consisting of the Project Coordinator, PI, Community Program Implementor, USC educators, and the USC Assistant Operations Manager will collaborate on the daily details of the project implementation and progress;
- The Regional Advisory Board is scheduled to meet semiannually, but will convene, either electronically or in-person, as needed;
- The National Advisory Board will meet via video conferencing to review and advise the project;
- Individual members of both boards are available for quick input; and
- Both USC and UCCC have strong networks of professional contacts, who while not included in this project, will offer their expertise as needed.

We do not anticipate any significant technical risks with the project. We are not using any large or sophisticated equipment that could require special handling, costly repairs, or intricate setup. Nor do we expect any problems with meeting reporting or briefing deadlines. Other resources and management issues that could present difficulties include:

- Hiring and training any additional staff quickly and sufficiently to meet the project's needs;
- Clearly sharing and meeting expectations for the workshop format, sites, audiences and set up with the CCC Coordinators in every region;
- Last minute changes in workshop schedules and/or available personnel; and
- Unexpected costs in areas such as travel, supplies or materials.

To minimize these and other possibilities, the project team will draw up a preliminary contingency plan during the first month of the project and share this with the Project Officer during the first briefing meeting in September 2009.

C. Milestone Log

Phase/Year 1:

Milestone	**Planned Completion Date**
Project Management Plan revisions	July 31, 2009
Evaluation plan completed	August 31, 2009
Curriculum and materials research	September 30, 2009
Website launched	September 30, 2009
DOE Project Officer briefed (1st Quarter Report)	September 30, 2009
Establish CCC Regional schedule	October 31, 2009
Interactive exhibits developed	November 30, 2009
2nd Quarter report submitted	December 31, 2009
Website revamped	March 31, 2010
3rd Quarter report submitted	March 31, 2010
DOE Project Officer briefed	May 31, 2010
Initial six workshops conducted	June 15, 2010
Evaluation data analysis completed	June 20, 2010

Year I Annual Report submitted	June 30, 2010
Interim dissemination	June 30, 2010

Phase/Year II

Milestone	**Planned Completion Date**
Project revised as necessary	July 31, 2010
Establish CCC regional schedule	August 15, 2010
Review and revise interactive exhibits	August 31, 2010
1st Quarter report submitted	September 30, 2010
2nd Quarter report submitted	December 31, 2010
3rd Quarter report submitted	March 31, 2011
Post-project web continuity implemented	April 30, 2011
Ten workshops conducted	May 31, 2011
Evaluation data analysis completed	June 15, 2011
Project final report submitted	June 30, 2011
Results disseminated	December 31, 2011

D. Marketing Plan

The project partners and staff will create and develop a Media Awareness and Involvement Plan (MAIP) as well as generate and distribute media packets with clear, concise fact sheets, video clips and audio clips useful for all of the media. We will invite media representatives from print, radio and television to participate in workshops where they can absorb the education objectives through hands-on activities and interaction with their fellow attendees. USC has a detailed media list with contact information that we will use for this task, and we will ask the other 5 Clean Cities Coalition regions to utilize a similar approach when recruiting audiences for their workshops.

In addition to these steps, the project will include publicity efforts to recruit the targeted audiences to workshops and the general public to community events. We will submit public service announcements to radio, print and television outlets, distribute flyers, list events in newsletters, send information to pertinent contacts within audience-related organizations, and request assistance from our collaborators and advisory board members to publicize the workshops and events. The project staff expects to generate a template of these actions for the other regions to incorporate into their publicity outreach.

E. Funding and Costing Profile

Project Funding Profile Table

	Phase 1		**Phase II**	
Team Member	**DOE**	**Other**	**DOE**	**Other**
PI: Joe Andrade	0	0	0	0
Partner: Robin Erickson	0	0	0	0
Proj Coord.	52,956	0	56,108	0
Com. Prog. Impl	7,706	0	8,015	0
USC Educator	5,138	0	5,343	0
USC Educator	4,867	0	5,062	0
Part time Educators (up to 3)	19,500	0	20,280	0

Project Costing Profile Table

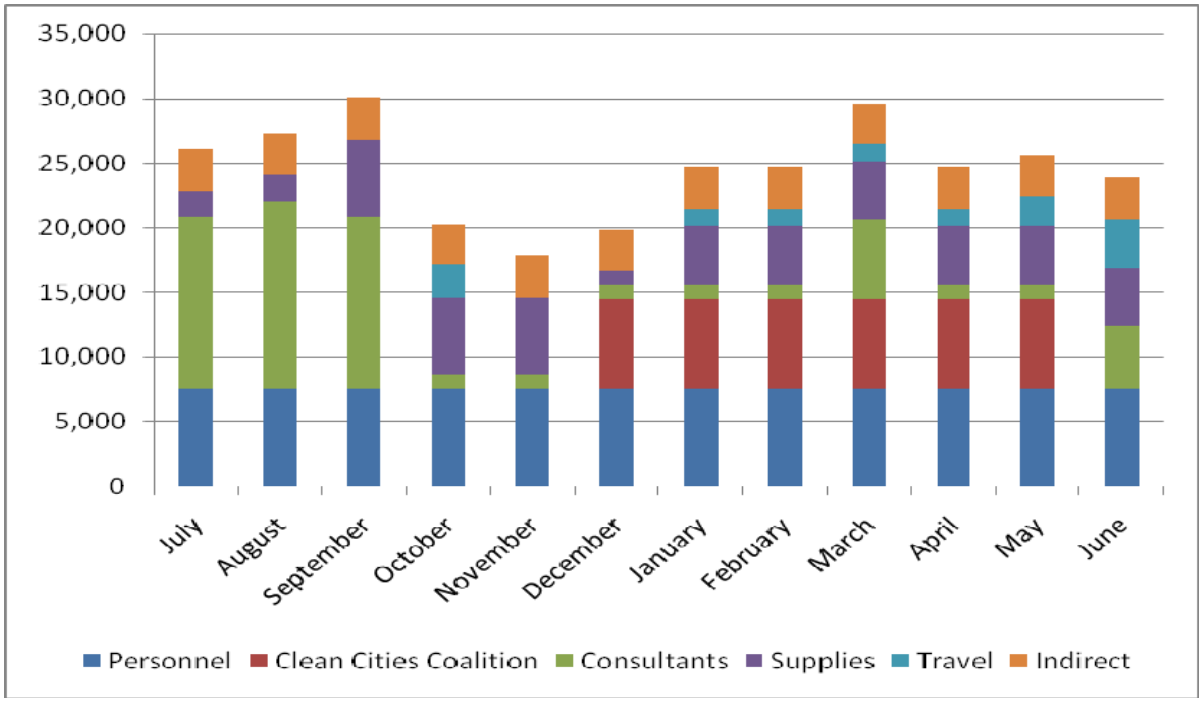
Month	**Personnel**	**CCC**	**Con**	**Supplies**	**Travel**	**Indirect**	**Total**
July	7,514		13,333	2,000		3,212	26,059

August	7,514		14,583	2,000		3,212	27,309
September	7,514		13,334	6,000		3,212	31,060
October	7,514		1111	6,000	2,500	3,212	20,337
November	7,514		1111	6,000		3,212	17,837
December	7,514	7,000	1111	1,000		3,212	19,837
January	7,514	7,000	1111	4,500	1,300	3,212	24,637
February	7,514	7,000	1111	4,500	1,300	3,212	24,637
March	7,514	7,000	6111	4,500	1,300	3,212	29,637
April	7,514	7,000	1111	4,500	1,300	3,212	24,637
May	7,514	7,000	1111	4,500	2,300	3,212	25,637
June	7,513		4,862	4,500	3,800	3,213	23,888
Total	**90,167**	**42,000**	**60,000**	**50,000**	**14,800**	**38,545**	**295,512**

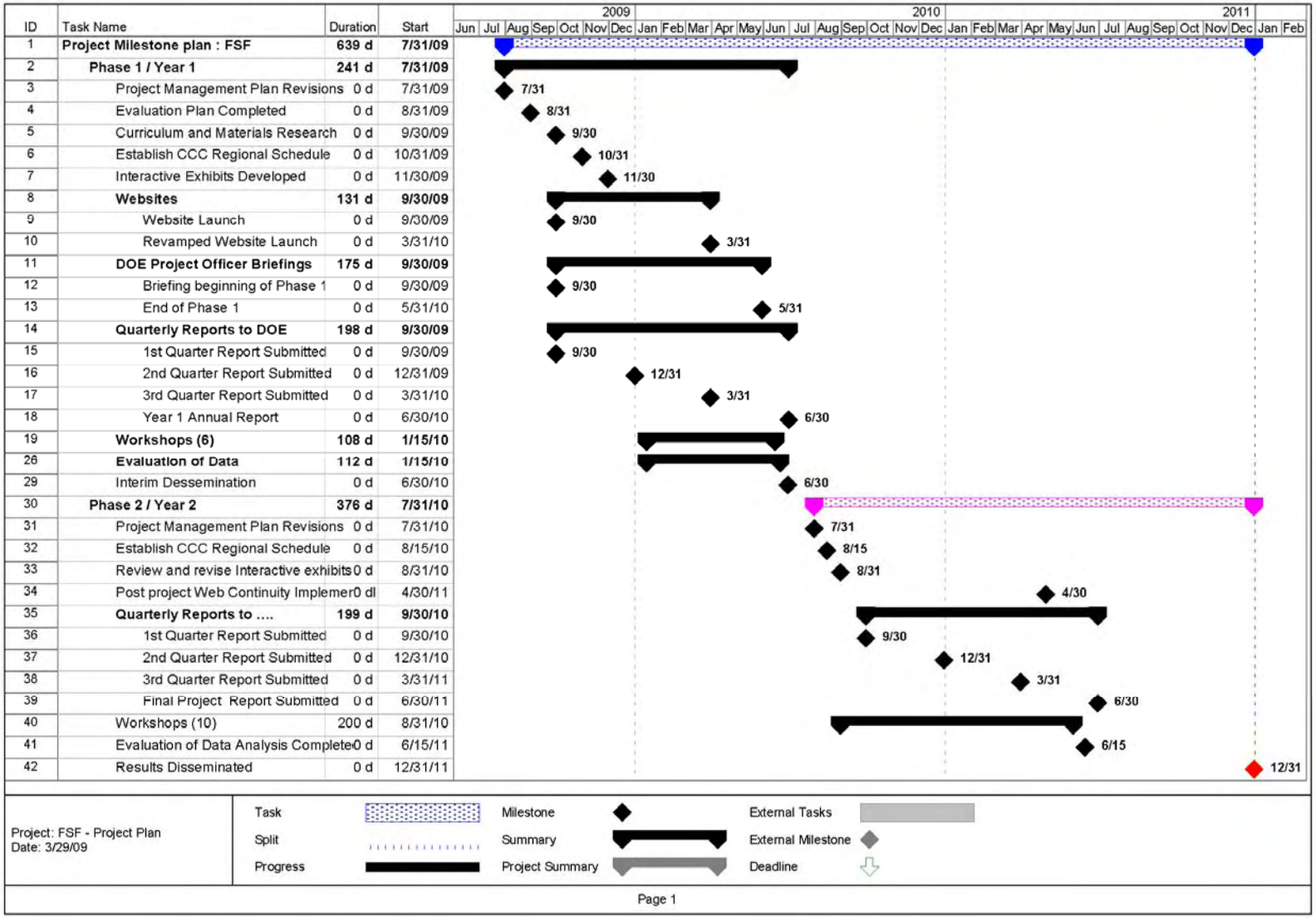
Personnel includes the Project Coordinator, Community Program Implementor, the two USC educators, and up to three part-time educators.
Clean Cities Coalition (CCC) is the money allocated to each region, sent out a month before the workshop.
Consultants (Con)

- $30,000 for the first three months for curriculum work, the remaining $10,000 prorated over the next 9 months.
- Web development allocated at $10,000 prorated over the first three months, the final $5,000 issued with the web revamp in March 2010.
- Evaluation plan is completed in August for $1,250 with the remaining $3,750 in June when the Phase l analysis is completed.

Figure 1: Cost Comparisons for Phase/Year I (July 2009 – June 2010)



F. Project Timeline



ID	Task Name	Duration	Start
1	**Project Milestone plan : FSF**	**639 d**	**7/31/09**
2	**Phase 1 / Year 1**	**241 d**	**7/31/09**
3	Project Management Plan Revisions	0 d	7/31/09
4	Evaluation Plan Completed	0 d	8/31/09
5	Curriculum and Materials Research	0 d	9/30/09
6	Establish CCC Regional Schedule	0 d	10/31/09
7	Interactive Exhibits Developed	0 d	11/30/09
8	**Websites**	**131 d**	**9/30/09**
9	Website Launch	0 d	9/30/09
10	Revamped Website Launch	0 d	3/31/10
11	**DOE Project Officer Briefings**	**175 d**	**9/30/09**
12	Briefing beginning of Phase 1	0 d	9/30/09
13	End of Phase 1	0 d	5/31/10
14	**Quarterly Reports to DOE**	**198 d**	**9/30/09**
15	1st Quarter Report Submitted	0 d	9/30/09
16	2nd Quarter Report Submitted	0 d	12/31/09
17	3rd Quarter Report Submitted	0 d	3/31/10
18	Year 1 Annual Report	0 d	6/30/10
19	**Workshops (6)**	**108 d**	**1/15/10**
26	**Evaluation of Data**	**112 d**	**1/15/10**
29	Interim Dessemination	0 d	6/30/10
30	**Phase 2 / Year 2**	**376 d**	**7/31/10**
31	Project Management Plan Revisions	0 d	7/31/10
32	Establish CCC Regional Schedule	0 d	8/15/10
33	Review and revise Interactive exhibits	0 d	8/31/10
34	Post project Web Continuity Implemer	0 dl	4/30/11
35	**Quarterly Reports to ....**	**199 d**	**9/30/10**
36	1st Quarter Report Submitted	0 d	9/30/10
37	2nd Quarter Report Submitted	0 d	12/31/10
38	3rd Quarter Report Submitted	0 d	3/31/11
39	Final Project Report Submitted	0 d	6/30/11
40	Workshops (10)	200 d	8/31/10
41	Evaluation of Data Analysis Complete	0 d	6/15/11
42	Results Disseminated	0 d	12/31/11

G. Success Criteria at Decision Points

Phase I

- August 1, 2009: Project Management Plan revised, distributed and discussed with key personnel;
- September 30, 2009:curricula and materials researched and compiled into a usable format; and website launched;
- October 31, 2009: Project Officer briefed; and the schedule of six workshops for Phase I completed and ready for implementation;
- November 30, 2009: Interactive exhibits developed;
- April 1, 2010: First few workshops completed; website revamped; and initial data collected for analysis; and
- June 30, 2010: Project Officer briefed; all six workshops completed; workshop data analyzed; 4th Quarter report filed; and up to 100,000 people impacted through workshops, community events, the project's interactive websites, and active media outreach.

Phase II

- August 1, 2010: Project reviewed and revised based on evaluation of Phase I.
- August 15, 2010: All workshops for Phase II scheduled.
- April 1, 2011: First few workshops of Phase II completed; and data collected and compared to the same point the previous year.
- April 30, 2011: Post-project website continuity established.
- July 1: Project Officer briefed; data analyzed; final report submitted; up to 200,000 new people impacted by project through workshops, community events, the project's interactive websites, and active media outreach.
- August 1, 2011: plans for regional and national project replication created and implemented.
- December 31, 2011: project results disseminated nationally through websites, professional journals and conferences, newsletters, media publications and stories, and related programs.