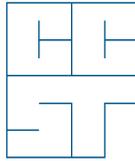


CCST ANNUAL REPORT 2013-2014



**INFORMATION
FOR CRITICAL
ISSUES IN
CALIFORNIA**



VISION FOR A BETTER FUTURE

California enhances its global leadership in science, technology, and innovation, which forms the foundation of a healthy economy, society, and environment.

MISSION OF CCST

CCST catalyzes leading experts in science and technology to engage with policy makers to ensure California's continued leadership in science, technology, innovation, and STEM education.

EXTERNAL LANDSCAPE: CCST BUILDS COLLABORATIONS AND CREATES COLLECTIVE IMPACT

CCST operates in a crowded landscape of entities seeking policymaker attention, funding, or fellows. Because CCST is statewide and convenes experts across disciplines and institutions it has access to an unparalleled science network and can build effective collaborations to conduct rigorous analytical assessments and create collective impact.

CCST COMPETITIVE ADVANTAGE

- An organization created by policymakers
- Modeled after the nation's leading science resource, the National Academies, with which it has an MOU
- Unparalleled network of resources (institutions, scientists, fellows, teachers)
- Convening power to address complex science and technology issues and to inform policy with rigor and objectivity

ABOUT CCST

CCST is a nonpartisan, impartial, not-for-profit corporation established via Assembly Concurrent Resolution (ACR 162) in 1988 to provide objective advice from California's best scientists and research institutions on policy issues involving science.

CCST is dedicated to providing impartial expertise that extends beyond the resources or perspective of any single institution. It receives support from public and private higher-education institutions, including the University of California, California State University, the California Community Colleges, Stanford University, and the California Institute of Technology, and major federal funded laboratories, including Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratory – California, Stanford Linear Accelerator, NASA Ames Research Center, and the Jet Propulsion Laboratory as well as leaders from the private sector.

CCST is governed by a **Board of Directors**, which is made up of 16 leaders from industry and academia, and oversees the following:

COUNCIL

The principal operational arm of CCST, the Council is comprised of 30 corporate leaders, academicians, scientists, and scholars of the highest distinction who serve as advisors to CCST. The Council identifies issues needing study and oversees production of reports; it also convenes the best and brightest science minds in the state along with policy makers in meetings three times a year. The Council helps the State proactively frame science and technology policy questions, and provides impartial, peer-reviewed, evidence-based analyses to help address these questions.

SENIOR FELLOWS

A broad network of 135 distinguished scientists, engineers, and technical experts, the Senior Fellows serve as a valuable resource for the Council when planning or executing reports.

CALIFORNIA TEACHER ADVISORY COUNCIL (CAL TAC)

A group of 12 outstanding K-14 science and math classroom teachers, Cal TAC provides a voice for the STEM educator community, involving teachers in discussions of education-related policy. Cal TAC produces studies focusing on issues important to science and math education and interfaces directly with policy makers.

SCIENCE AND TECHNOLOGY POLICY FELLOWS

A group of 10 PhD-level experts who serve one-year fellowships in the state Legislature, Policy Fellows increase the opportunity for policy to be informed by science and receive training and experience in helping effectively bring their scientific expertise to a policy setting.

LETTER FROM BOARD CHAIR

CHARLES F. KENNEL

As CCST's new Board Chair, I've been fortunate to be named to a unique position: There are no other states quite like California in the US and, within the state, there are no other organizations quite like CCST. We are a reflection of the greatest strengths of California's science and technology community – but, like California, we are also constantly facing a wide range of complex issues with long-term implications – a range of issues that is partly a result of our own expanding reach.

Our mandate is to leverage California's scientific expertise in an efficient, nonpartisan manner to provide rigorous analytical assessments of science- and technology-related issues for the state. Since 1988, we have done so on an increasingly broad range of subjects including energy, intellectual property, biotechnology, STEM education, water technologies, and more. Many of these projects have been conducted at the behest of the Legislature, the Governor, or various state agencies. Many, however, we have conducted on our own initiative, bringing light to issues which may not yet be on policymakers' radar but which our stakeholders think have potential significance for policy discussions to come. We can do this because CCST includes more of California's science and technology stakeholders than any other institution, public or private.

Over the past several years we've been focusing on ways to expand our reach and provide more opportunities for decision-makers to access and interface with the expertise of our network. Thanks to the Gordon & Betty Moore Foundation and others, we established the highly successful CCST Science and Technology Policy Fellows program in 2009; it places PhD-level experts in the offices of policymakers or on staff of legislative committees for one-year fellowships. We also created the California Teacher Advisory Council in 2005, which brings together some of California's best K-14 STEM teachers to provide the wisdom of practice to educational policy discussions, including the critical emerging area of digitally enhanced education.

These have been significant changes for CCST, expanding the discussions in which we participate and the areas in which our world-class experts are providing advice. I believe that there is much more that we can do. California is facing numerous decisions on its water and energy infrastructure that will shape the state's future for decades to come. To ensure the best possible outcomes for California, we have focused on these areas to deliver the best information available directly to decision makers.

There is tremendous power in a collective voice. It's our job to serve as a trusted, independent, expert resource, and we have done so for more than twenty-five years. I look forward to working with our members and stakeholders to ensure that the next twenty-five are even better.

In beginning my tenure as Board chair, I am succeeding a person whose impact on CCST cannot be overstated. Karl Pister led the Board for more than twenty years, and it was in very large part due to his passionate vision and capable guidance that CCST has managed to grow and evolve into the effective and far-reaching organization it is today. It has been a true privilege and a pleasure to work with Karl, and the memories of his steadfast wisdom will be my guide in the years to come. I doubt that anyone can truly fill Karl's shoes, but I will do my best to carry out his vision and continue CCST's growth in the service of California and its people.



Charles F Kennel

LETTER FROM COUNCIL CHAIR

COREY GOODMAN

No state finds it easy to contemplate policy decisions on infrastructure issues that span multiple agencies, industries, and constituencies. California's water and energy needs have been a particular focus for nearly 15 years, but the recent drought has prompted a particularly close reassessment of the state's overall water infrastructure and strategy. CCST delivered a critical report this year – Achieving a Sustainable Water Future through Innovations in Science and Technology. This report – two years in the making – provides a science and technology roadmap about water for policymakers to ensure that California can guarantee availability of water for decades to come.

The roots of this report on water go back several years to a broad assessment of California's innovation 'ecosystem' in 2011 that identified water infrastructure as a critical element of California's future. We couldn't foresee the drought, of course, but we already knew that California's water infrastructure would benefit from the type of analysis that CCST can provide. We don't just respond to requests for information – we proactively engage with agencies such as the Department of Water Resources to identify issues of significance, and we were pleased to assist with the update to the California Water Plan. With the most significant drought our state has ever faced, our work was more timely than we could have anticipated.

California's scientists – such as the renowned experts associated with CCST – value the Council as an effective way to apply their expertise to solving challenging societal problems. They help us identify important issues and help us produce peer-reviewed studies for policymakers. To effectively help frame policy questions, the Council serves as a nexus with both policymakers and the best and brightest policy minds in the state in California's leading science and technology institutions to determine the issues that need attention and to produce evidence-based analyses.

CCST has historically focused its efforts around a small number of issues each year, reflecting the priorities identified by the Council along with California policymakers with whom we interact. An example is our work on energy – where, since our overview of California's Energy Future in 2011, we have produced

nine reports on specific technologies, as well as some technical papers. This work is an unmatched resource to a state that has embraced renewable energy with a more ambitious agenda than any other state. To be successful, California must be informed by rigorous analysis of what is possible with today's technology, where the state must invest to meet 2050 goals, and what energy portfolio is required. Our work on California's Energy Future is a good example of how we can effectively and proactively engage with policymakers, executive-branch agencies, and leading California scientists to identify the key issues California must address to achieve its goals, including scenario-based policy analyses and recommendations.

In chairing the Council and addressing critical California issues, I am convinced that CCST is an organization that operates in a class of its own in California. We celebrate California's vision in creating this unique organization more than 25 years ago.

Like California, a state known for its forward-thinking S&T policy and innovative spirit, we are looking to the future and our unique role in answering critical questions California must address. I look forward to building on CCST's powerful legacy of informing science-based policy and, as Council Chair, commit my full focus to providing sound science and technology advice to policymakers at a time when important decisions will address daunting issues, ensure our competitiveness for investment and leadership in innovation, and – regardless of the politics – a rigorous focus on the science and technology issues that confront our nation's leading innovation state, California.



Corey Goodman

EDITORIAL FROM SUSAN HACKWOOD, EXECUTIVE DIRECTOR

IMPACTFUL, IMPARTIAL EXPERTISE

This is an important time for CCST in addressing critical but contentious issues. With the state on an economic upturn, Sacramento is looking for the best ways to invest in California's continued leadership in science and technology. While California remain the nation's leader by many S&T indices, just maintaining the status quo will mean that we will fall behind. We could have no better leadership at this pivotal time than our Board Chair, Dr. Charles Kennel, and our Council Chair, Dr. Corey Goodman.

Issues like hydraulic fracturing and greenhouse gas reductions are complex and not easy to resolve with quick sound-bites. CCST, as always, aims to inform policymakers with non-partisan, peer-reviewed, fact-based input. This can be challenging for policy makers, because there aren't always easy answers. Making decisions on many science- and- technology-related policies involves balancing many pros and cons, some of which may not be fully understood, and a long-term view that isn't always easy to sell to a public who want quick results.

Our focus for the past year has been on issues with significant potential to transform our state: **digital education**, which means new, untested roles for teachers that offer transformational potential for the education of our children; a **systems approach to water**, with high-quality information provided through a portal that everyone can use; providing independent and credible information on **oil-well stimulation** that inform decision-makers efforts to balance good jobs, safety and environmental challenges. The scope of these current issues represents what CCST brings to California – a breadth and depth of expertise, a sophisticated and nuanced examination of the issues, and sound, fact-based analyses.

These questions aren't easy to address, but CCST is uniquely suited to bring an unmatched, impartial expertise to handle the hard questions, and we are ready to do so.



Susan Hackwood

INFORMING FOUR CRITICAL ISSUES FOR CALIFORNIA

This year, more than ever before, CCST has taken on a big agenda that focuses on four issues that are timely and important to California's future.

What we do for all CCST reports:

- Convene **world-class experts**
- Set a high bar for **disclosure of conflicts of interest**
- Conduct thorough, **objective work**
- Ensure **rigorous peer review before reports are published**

These underpinnings result in reports that we are proud of and that we hope will inform policymakers and lead to great policy.

ACCESSING THE FUTURE: GETTING DIGITALLY ENHANCED EDUCATION RIGHT

Digitally enhanced education (DEE) has arrived in California's classrooms, but there's little data or evidence-based guidance about what works, for whom, and under which conditions – not just in California, but anywhere. Thanks to CCST's California Teacher Advisory Council (Cal TAC), we are seeking the answers. Cal TAC has been working to facilitate a better understanding of how California can get digital education right.



DEE?

It's not just another acronym, but a multi-faceted approach to technology-based education that CCST is uniquely qualified to assess for math-science education. DEE includes instructional materials, virtual schools and classrooms, learning management systems, online discussion forums, online learning, digital libraries, social networks, and more.

Home to Silicon Valley and many innovative companies doing cutting-edge work in this important area, California should embrace DEE in a big way to benefit the state's six-million students. It's a fast-evolving area in need of sound metrics that will measure its access to students in every school, new ways to attract young people to the fascinating world of mathematics and science, and the development of a generation of high achievers who will have limitless career opportunities in an innovative state.

CCST AND DEE IN CALIFORNIA

CCST has tapped into a comprehensive cross-section of stakeholders in education, science and technology institutions, policy and technology providers, engaging them with Cal TAC's educators in a series of symposia that has explored the state of the art in this emerging area. Cal TAC's award-winning master teachers from the K-14 education system bring the wisdom of practice and the classroom perspective to this important discussion. Cal TAC's perspective is centered on the classroom environment, the teacher, the institutional infrastructure, as well as creative partnerships to make California DEE world-class.

Over the past year, CCST and Cal TAC convened a series of symposia, **The Efficacy of Digitally Enhanced Education in California**, which have brought together representatives of the education, technology, policy, research, and philanthropic communities. This series was designed as an ongoing conversation among those with distinct but complementary perspectives on the efficacy of DEE and its promise as a great equalizer, helping economically disadvantaged and second-language learners. Cal TAC has briefed policymakers in Washington DC and Sacramento on the results of our efforts and worked with the National Academies Teacher Advisory Council, to showcase nationally our work in California.

We must shift from thinking about technology as an add-on, and move towards a more integrated understanding of what is possible.



"It's a good time for us to be thinking at the state level about setting expectations and supporting the kinds of technology-related changes we're trying to make."

Mary Vixie Sandy, EdD, Executive Director, California Commission on Teacher Credentialing

A SYSTEMS APPROACH TO WATER: CALIFORNIA'S LIFEBLOOD

Water is the fundamental resource challenge facing California, and its planning and management is vital to California's economy and environment. Improving the way we extract, treat and use water in the future is critical to California's future, not just for our state but for the country and the world. CCST delivers the most promising science and technology to California decision-makers to improve water management and secure California's economic future.



WHY WATER?

For much of our large and growing state, especially urban areas in Southern California and the agricultural areas, depends on water transported in from far away. In fact, when CCST assembled experts in 2011 to discuss how to keep the state's high-tech innovation economy strong, improving California's water system was one of the **top two issues** they cited. Clean water is essential to support our population growth, and California is the nation's number-one state in agricultural production, producing more than 400 commodities for distribution nationally and abroad. But our growing population, critical science and technology industries and our farms require a stable, efficient water supply to thrive and be sustainable.

A THOROUGH LOOK AT THE OPTIONS

CCST assembled key stakeholders and gathered input from more than 150 water experts, holding meetings throughout the state to tap into expertise from state, federal, and local agencies, academia, federal research laboratories, NGOs, and the private sector. The result is a clear overview of the state's water cycle, providing a roadmap to the issues – and potential solutions – at each stage of the cycle. The study was incorporated into the 2013 Update of the California Water Plan facilitated by the California Department of Water Resources (DWR) and the Governor's Water Action Plan prepared by the California Natural Resources Agency, the California Department of Food and Agriculture, and the California Environmental Protection Agency.

California has a legacy of success in leveraging technological innovation. As a result, many of the needed solutions already exist or are in late-stage development,

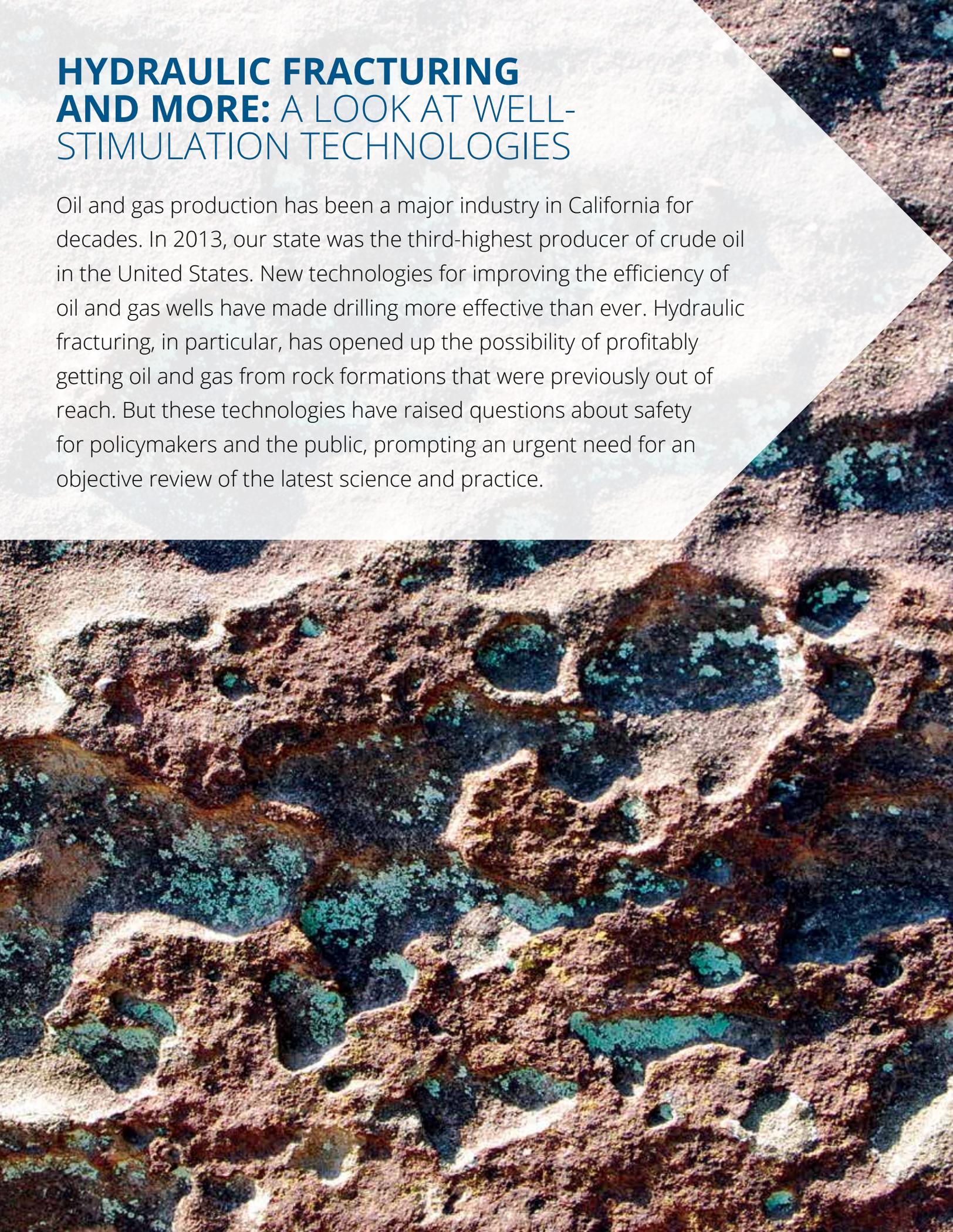
such as soil moisture sensors to efficiently irrigate crops in real-time, and the use of improved wastewater cleanup and recycling technologies. The challenge lies in coordinating the statewide application of science and technology at every stage in the water-use cycle.

Above all, the state needs a **comprehensive, integrated, statewide water information system**. California's water system is enormous, complex, and requires high levels of cooperation and information exchange from a myriad of agencies at the local, state, and federal level. It also requires full and transparent communication of data from all water extractors and users. The state needs a way to better monitor and understand its water systems overall to create an informed water strategy that uses a range of technologies, policies, and approaches. CCST has shared our analysis with policymakers in Washington, DC and Sacramento.

Maintaining a sustainable water system is a difficult and long-term challenge. But technology and innovation can help change the rules of the game, if you know where and how to best apply them. Time is of the essence, and CCST's science and technology roadmap for the water cycle is designed to help California respond to this crisis in a timely and cost-effective manner.

HYDRAULIC FRACTURING AND MORE: A LOOK AT WELL- STIMULATION TECHNOLOGIES

Oil and gas production has been a major industry in California for decades. In 2013, our state was the third-highest producer of crude oil in the United States. New technologies for improving the efficiency of oil and gas wells have made drilling more effective than ever. Hydraulic fracturing, in particular, has opened up the possibility of profitably getting oil and gas from rock formations that were previously out of reach. But these technologies have raised questions about safety for policymakers and the public, prompting an urgent need for an objective review of the latest science and practice.



SQUEEZING OIL AND GAS FROM ROCK

Well stimulation involves injecting proprietary mixtures of chemicals into the ground, making it easier to withdraw oil and/or gas from the rock. This can involve using mixtures of water and chemicals injected under high pressure to fracture the rock and prop the fractures open (hydraulic fracturing), acid fracturing to etch channels in the rock, or matrix acidizing where acid dissolves sediments and mud solids. Hydraulic fracturing is the main technique used in California.

Expanding the areas of California available to drilling represents a major economic opportunity. But there are unknowns about the safety of well-stimulation techniques. Some have asserted links between use of these techniques and contamination of local water tables, as well as seismic events.

CCST CUTTING TO THE HEART OF A COMPLEX ISSUE

The economic and environmental stakes involved in this issue demand solid information that is both thorough and independent. That's why CCST has been separately commissioned by both the Federal Bureau of Land Management (BLM) and the California Natural Resources Agency to prepare up-to-date technological assessments of well-stimulation technologies.

CCST's inter-institutional network brought a unique breadth and depth of experts to the BLM project. We brought together a steering committee whose members were chosen for their technical expertise and balance of viewpoints, and brought in CCST affiliate institution Lawrence Berkeley National Laboratory to carry out the analysis and literature review. The result was the **first comprehensive state-level analysis of its kind**, delivered at the end of August 2014. We are bringing the same rigor to an expanded scope of work in our analysis for the California Natural Resources Agency under SB 4 (Pavley), due in 2015.

For both projects, CCST provides a detailed assessment of the central questions behind this complex issue for policy makers: What are the technologies and how do they work? What parts of California could be open to drilling with these technologies? And what are the potential environmental risks?

Hydraulic fracturing and other well-stimulation techniques have stirred a lot of public debate and comment on issues that demand objectivity and science-informed policy decisions. With these projects, CCST is providing a balanced, comprehensive look at the pros and cons of technologies with significant economic potential for California.

BUILDING POLICIES FOR A BETTER ENERGY FUTURE

Innovation is an essential part of building our future – not just in technological innovation, but in policy as well. California is well-known as a national trailblazer in this regard, with its landmark legislation on reducing greenhouse gas (GHG) emissions by 2050, inducing serious consideration of alternative energy strategies. In the highly regarded **California's Energy Future** report series, CCST has rolled out a detailed and comprehensive look at the possibilities and limitations of current energy technologies towards meeting these ambitious emissions goals.



POLICY FRAMEWORK NEEDED

Developing the right combination of technologies is only part of the answer to lower emissions, however. To reach its goals of reducing emissions and growing a more climate-friendly, reliable and economically efficient electrical system, California needs a policy framework that will enable the best energy technology deployment decisions. That's why CCST continued the Energy Future series with a project that focused exclusively on the implications of our technology analyses for policy.

THE RIGHT PRICE AT THE RIGHT TIME

The way electrical power is currently billed is an obstacle to more widespread adoption of electric vehicles. It only costs about \$.05 per kilowatt hour to provide off-peak electricity when recharging is convenient, but many customers face rates that are more than six times this cost. The same misalignment of rates with costs is also hindering the development of grid storage, which is important to manage increased use of intermittent renewable generation such as wind and solar power, as well as participation in demand response programs that avoid inefficient, high-emission peak generation. A time-sensitive pricing structure that better aligns prices with costs of service would help address these issues. It would also encourage the development of other technologies to further improve all of these GHG-reducing actions.

EXPANDING BIOFUELS

Biofuels, which can replace gasoline or diesel and are produced from natural resources, have a lot of potential to contribute to California's energy needs. But biofuels aren't widely used, in part because production is limited and costs won't be competitive until biofuels are produced on a bigger scale. In our second energy policy report, CCST explores whether the state has the right incentives in place to attract private investment and scale up production.

"Understanding the technical aspects of energy technologies is only the first step towards building a sound energy future for California."

Jane C.S. Long

SCIENCE AND TECHNOLOGY INFORMING POLICY: THE CCST FELLOWS

In 2009, CCST launched a program to embed scientists directly in the California state legislature. Ten young PhDs were awarded fellowships in a variety of committee and legislator offices in Sacramento. The idea was to enable these Fellows to learn about the realities of translating science and technology concerns into a policy context and to assist policy-makers in addressing complex scientific and technical issues. Five years later, this pilot program has been declared a success and extended. Our Fellows are in high demand in Sacramento, and their contributions have been praised year after year on the floor of the California Assembly and Senate.

EXPERTISE AT THE GROUND LEVEL

The interface between science and public policy grows more important year after year. In fact, it goes to the core of CCST's mission – to leverage the knowledge and expertise of the science and technology community to help inform the State about critical policy issues. As an independent resource outside of government, CCST has been doing this for most of its history – convening experts to help answer questions posed by California state agencies and policy makers.

The CCST Policy Fellows represent a different way of connecting with Sacramento. Fellows serve as staff to offices in Sacramento, bringing perspective and expertise to policy discussions among policy-makers at

the earliest stages of policy discussions. CCST Fellows analyze legislation, provide expert testimony, staff legislative hearings, negotiate legislative amendments, meet with constituents, and more. **Fellows serve as trusted members of the legislative team.** Importantly, many of the Fellows stay engaged in policymaking post-Fellowship by remaining in the Legislature as full-time employees, providing a lasting benefit to California policymaking.

A UNIQUE EDUCATION

The Policy Fellows don't just contribute to the offices where they're placed: they receive a matchless introduction to the world of policy, learning the ins and outs of policy discussions in a way that they can't get anywhere else. Before they set foot in the Capitol, CCST runs them through a rigorous, multi-week 'boot camp' to prepare them to work in a legislative setting. During the year, regular seminars with leaders of State agencies such as Cal EPA, the Natural Resources Agency, Health and Human Services, Food and Agriculture, and Cal Recycle provide the Fellows with a direct line to the heart of Sacramento policy discussions.

BUILDING A NEW NETWORK

The Fellows' contributions don't end when their year in Sacramento is up. Many past Fellows have gone on to positions in academia, industry and government, both State and Federal. And this past year, CCST developed a Policy Fellows Alumni Network to enhance and sustain the contributions of current and former Fellows. The CCST Policy Fellows have become a valuable and unique part of CCST's network of expertise.

"This is a terrific program where we give those interested in science and technology the opportunity to work in the Legislature for a year. It is very significant because public policy now so often involves technology and science. These people have done a great public service."

Senate President pro Tem
Darrell Steinberg

CAL TAC – INCREDIBLE TEACHERS ON THE VANGUARD OF CHANGE

Science, technology, engineering, and mathematics (STEM) education is a vital underpinning of the state's science and technology leadership. Our schools train and prepare the next generation of scientists and engineers, providing an essential pool of expertise for research institutions and the high-tech industry to draw upon. In many analyses and discussions about education, however, one group has been absent: K-14 teachers. CCST has changed that with the creation of the **California Teacher Advisory Council (Cal TAC)**.

CCST formed Cal TAC in 2005 as a way to bring real-world classroom experience to policy-makers. Modeled after a similar initiative of the National Academy of Sciences, Cal TAC has become a distinguished and unique California resource that has not only led CCST studies on education policy and practice, but facilitated valuable discussions of critical modern classroom issues such as digitally enhanced education.

BEST OF THE BEST

STEM teachers selected for Cal TAC represent the very best California has to offer. Award-winning, highly accomplished teachers from the K-14 system, these teachers are no strangers to taking the lead in making sure that their classrooms offer the best possible science and math educational experience. Several Cal TAC members are National Board Certified. They sit on state and national committees to explore curricula, working to provide greater opportunities for students to engage in the STEM disciplines as well as improve their academic performance. And many of them have won national recognition for their efforts.

THE DIGITAL EDUCATION QUESTION

Digitally enhanced education – the effective use of technology in the classroom – is a hotly debated topic nationwide. Districts and states are trying a myriad of technologies in search of the optimum composition that enhances student performance, makes more educational opportunities available to a wider segment of the student population, and controls costs. The technologies are so new, however, and evolving so quickly that it isn't clear yet what works and what doesn't.

California can lead in digital education and Cal TAC has been at the vanguard of the discussion. Since 2011, Cal TAC has been conducting regular summits and symposia on digitally enhanced education, publishing proceedings and, most importantly, maintaining a consistent dialog over time to provide an evolving perspective focused on best practices, sound metrics and accountability. Cal TAC teachers are effective communicators and have briefed policymakers in both Sacramento and in Washington, DC on the policy implications of this work.

CCST

NIMBLE, RESPONSIVE AND EVOLVING WITH THE TIMES

CCST was founded in 1988 to serve as a source of unbiased advice on science and technology issues for the State. By the time CCST adopted its first strategic plan in 1996, it asserted an even more ambitious objective: to be not just a source of expertise, but an “essential element of public policy, molder of public opinion, and independent counsel to all that relates to science and technology policy in California.”

Since then a lot has changed in California. Technologies that were in their infancy have spawned multibillion-dollar industries. The world has become a much more interconnected place, changing the nature of high-tech research, manufacturing, and education. The State has had to continually devise and adapt policy frameworks for a host of rapidly evolving issues including nanotechnology, wireless networks, biotechnology and waste management.

Through it all, CCST has vigorously adapted to the expanding needs of the times. When CCST was started, it consisted largely of representatives from the academic institutions that formed its core support based on the founding legislation. CCST rapidly reached out to industry and the federal laboratories, formally adding the six largest federal funded laboratories as affiliates.

CCST has also built additional networks of expertise to facilitate its mission. The first was the **Senior Fellows Program**, which nominated distinguished scientists and technology leaders to support CCST projects – many of whom are CCST Board and Council members whose terms had concluded. Next was the **California Teacher Advisory Council (Cal TAC)**, a group of carefully selected master teachers who bring their ‘wisdom of practice’ to STEM education policy discussions. And, for the last five years, the **CCST Science & Technology**



Policy Fellows program has placed PhDs for year-long appointments in Sacramento policymaker offices, providing on-the-spot scientific expertise and perspective.

CCST has also become much more proactive. We are no longer just a resource to help the State answer science and technology questions; we help the State understand *what questions need to be asked*. Our Council is ready to provide peer-reviewed research at the request of the State, but it also focuses on critical issues that it believes California needs to know about, such as water and energy infrastructure. And it does so over time, benefiting from an independent institutional memory that allows it to develop nuanced longitudinal analyses unconstrained by election cycles.

During its first twenty-six years, CCST has not only met but vastly exceeded its founders’ ambitions. Its advice is sought by policy makers and members of the science and technology community in both California and throughout the nation. Its focus on issues critical to California is possible because CCST is flexible, adaptable, and ahead of the curve as it continues to provide expertise and advice to the State in years to come.

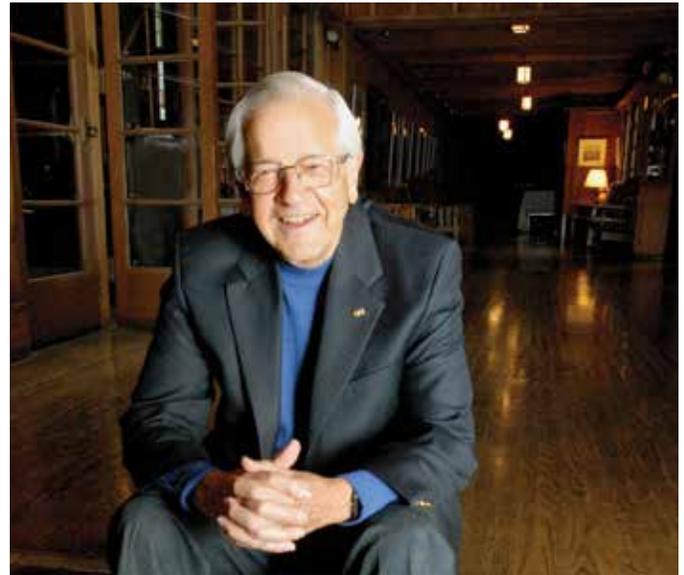
SPECIAL TRIBUTE: KARL PISTER

This year saw the end of an era at CCST as longtime Chairman of the Board Karl Pister stepped down after more than two decades of service to CCST.

His time at CCST has seen the organization grow from relatively modest beginnings to a nationally known, one-of-a-kind resource for the State with a variety of programs in place to harness and disseminate the State's science and technology expertise. From the beginning, Pister has taken the long view in helping shape CCST's goals.

"Building integrity and authority is something you can't do overnight," he noted as CCST celebrated its first two decades in 2008. Persistence has been a major theme of Pister's career, not just with CCST. With a background in civil engineering, theoretical and applied mechanics, prior to retirement he completed five decades of service to higher education, a distinguished career that ran the gamut from professor to dean to Chancellor of UC Davis, to Vice President of Educational Outreach at the University of California. He's accumulated numerous awards during his distinguished career, including the Vincent Bendix Award for Minorities in Engineering, the Lamme Medal for his contributions to engineering education, the Berkeley Medal, the Presidential Medal of the University of California, and the Presidential Award of the American Society of Mechanical Engineers, among others.

His passion for education has involved him with many organizations besides CCST. He is a member of the National Academy of Engineering, a fellow of the American Academy of Arts and Sciences, the American Academy of Mechanics, the American Society of Mechanical Engineers, the American Association for the Advancement of Science.



Peg Skorpinski Photography

From the beginning, Pister understood the potential role that CCST could play. Under his guidance, the Council has evolved from a virtually unknown entity in Sacramento to a position today where elected officials and state agencies routinely seek CCST's advice.

This growth has been possible in large part because of the integrity, credibility, and dedication that Karl Pister brought as Chairman of the Board. His many connections with organizations in California and beyond have helped CCST grow and build productive networks and partnerships, such as with the Center for the Future of Teaching and Learning. His dedication to educational issues has ensured that CCST has kept STEM education as a central component of its overall focus. But mostly, his wisdom, experience, and leadership have ensured that Board members, Council members, Senior Fellows, and state leaders have had faith that CCST could fulfill and exceed its mandate of independence, rigor, and expertise.

CCST is exceedingly fortunate to have benefited from Karl Pister's stewardship. He may be gone from our boardroom, but the legacy he leaves behind is a lasting cornerstone of CCST's identity and success.

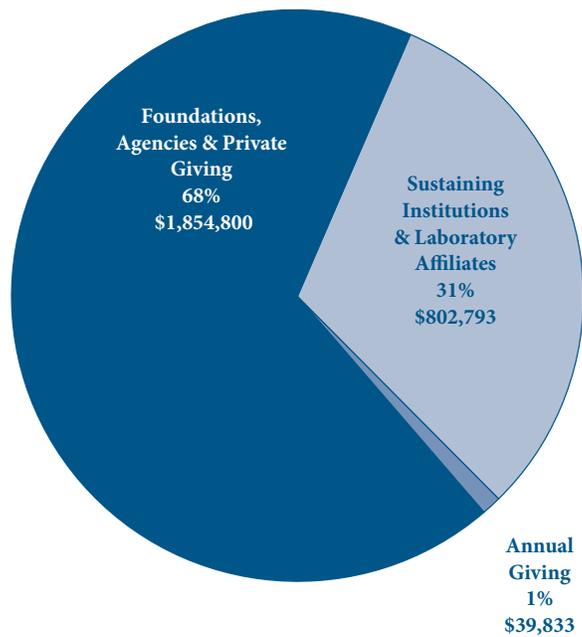
FINANCIAL HIGHLIGHTS

OPERATIONS

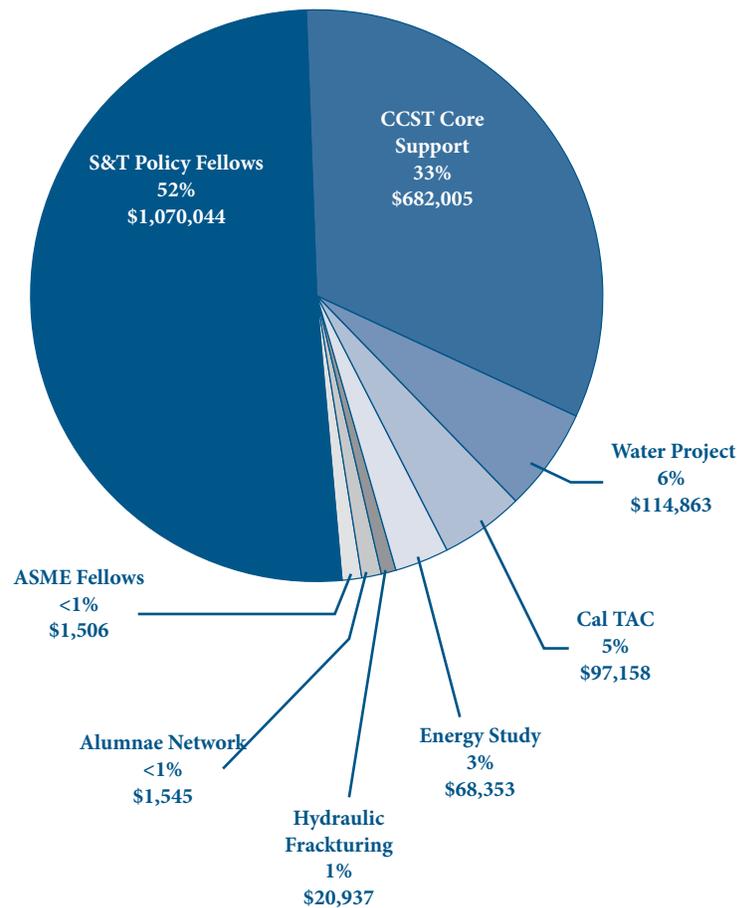
Highlights from CCST’s financial statements from January 2013 through December 2013 show the sources and uses of funds as a 501(c)(3) not-for-profit organization. Full financial statements, which are audited annually by Teaman, Ramirez & Smith, Inc., are available upon request. CCST retains two offices, one in Sacramento adjacent to the State Capitol and one in Riverside, both under the direction of the Executive Director.

Operating costs are covered through core funding received from our Sustaining Institutions and Laboratory Affiliates. The S&T Policy Fellows program is in its fifth year and is labeled below as an individual project. Annual giving and other projects, including some overhead allocation, are also categorized separately.

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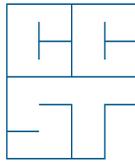
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