



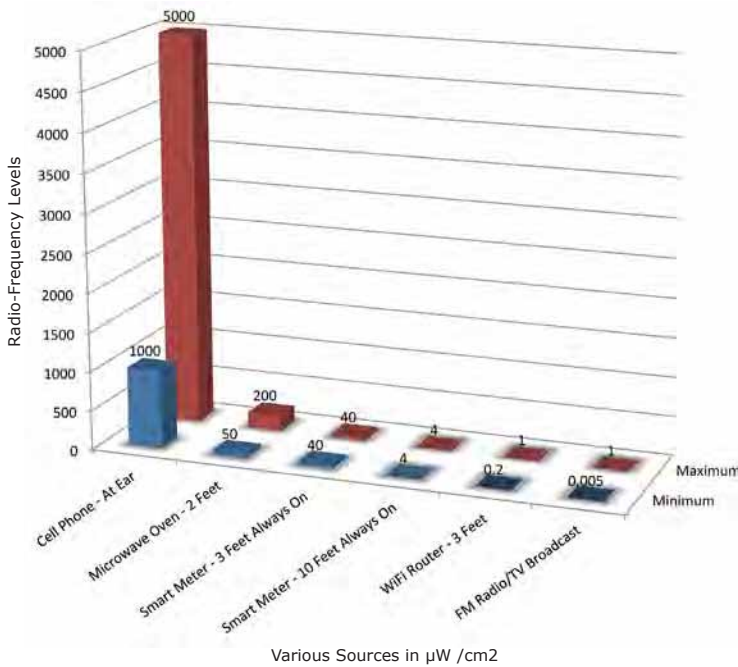
# Smart Meters Safe, But Debate Not Over

CCST's report, "Health Impacts of Radio Frequency from Smart Meters," was made available for public comment on January 11. The long-awaited report indicated that the meters meet current FCC standards for safety and generate less EMF emissions than other household devices such as cellphones and microwave ovens.

"It was our hope that a rigorous, independent scientific analysis would elevate the debate over smart meters and help point the way to sound, science-based public policy decisions," said Assemblymembers Jared Huffman and Bill Monning in a joint statement to the press. "We are grateful to CCST for undertaking this project, for assembling an impressive team of independent experts and reviewers, and for working diligently to complete a report that is responsive to our requests." Huffman and Monning made the original request to CCST asking for the evaluation of smart meter safety.

CCST agreed to compile and assess the evidence available to address the following two issues:

- Whether FCC standards for smart meters are sufficiently protective of public health taking into account current exposure levels to radiofrequency and electromagnetic fields.
- Whether additional technology specific standards are needed for smart meters and other devices that are commonly found in and around homes, to ensure adequate protection from adverse health effects.



Comparison of Radio-Frequency Levels from Various Sources in µW/cm²

## Key Report Findings

1. Wireless smart meters, when installed and properly maintained, result in much smaller levels of radio frequency (RF) exposure than many existing common household electronic devices.
2. The current FCC standard provides an adequate factor of safety against known thermally induced health impacts of existing common household electronic devices and smart meters.
3. To date, scientific studies have not identified or confirmed negative health effects from potential/nonthermal impacts of RF emissions such as those produced by existing common household electronic devices and smart meters.
4. Not enough is currently known about potential non-thermal impacts of RF emissions to identify or recommend additional standards for such impacts.

## Other Considerations

1. As wireless technologies of all types increase in usage, it will be important to: (a) continue to quantitatively assess the levels of RF emissions from common household devices and smart meters to which the public may be exposed; and (b) continue to investigate potential thermal and non-thermal impacts of such RF emissions on human health.
2. Consumers should be provided with clearly understood information about the radiofrequency emissions of all devices that emit RF including smart meters. Such information should include intensity of output, duration and frequency of output, and, in the cases of the smart meter, pattern of sending and receiving transmissions to and from all sources.
3. The California Public Utilities Commission should consider doing an independent review of the deployment of smart meters to determine if they are installed and operating consistent with the information provided to the consumer.
4. Consideration could be given to alternative smart meter configurations (such as wired) in those cases where wireless meters continue to be a concern to consumers.

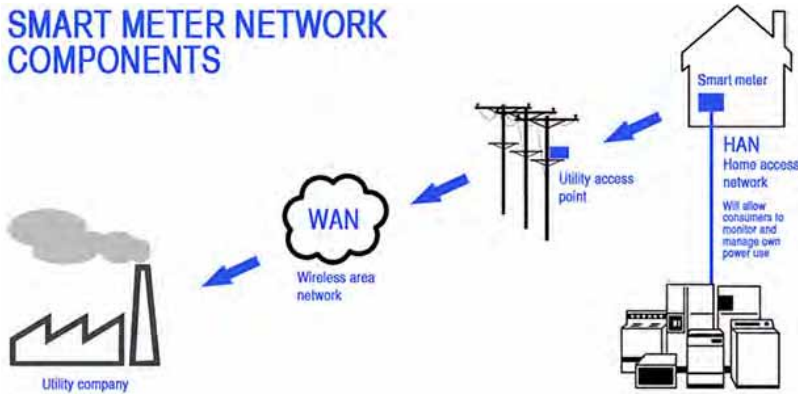
"The independent evaluation by the California Council on Science and Technology represents a good start to all those with unanswered questions on the potential health impacts posed by smart meters," stated Assemblymember Monning. "This will help inform both elected officials and the public about the safety of smart meters and facilitate future conversation."

*"We are grateful to CCST for undertaking this project, for assembling an impressive team of independent experts and reviewers, and for working diligently to complete a report that is responsive to our requests."*

*- Assemblymembers Jared Huffman and Bill Monning*

Smart meters are electronic monitoring devices that continuously measure the electricity output from each household and business. They communicate on a regular basis back to the utility. The goal is to enable power companies to better understand patterns of power consumption throughout the

## SMART METER NETWORK COMPONENTS



Simplified depiction of smart meter system network. Arrows show the use of radiofrequency (RF) signals for automated meter reading, communications among electric power meters, relays, access points, and the company's enterprise management systems. The future home access network will operate within the house.

day and adjust power generation accordingly. The Pacific Gas and Electric Company (PG&E) and other utility service providers have been installing wireless smart meters statewide in California since November 2006 under the authority of the California Public Utilities Commission (CPUC), which is seeking to guide the development of a "smart grid" power system in California.

The report generated considerable media coverage, which was divided on whether the evaluation established that smart meters were safe or not. The conclusion that further research is warranted on the effects of non-thermal radiation led some critics to assert that opposition to the meters is justified despite the CCST's assertion that the meters' output is well within FCC guidelines.

### Smart Meter Project Team

**Rollin Richmond (Chair)**  
President, Humboldt State University, CSU

**Jane Long**  
Associate Director at Large, Global Security Directorate Fellow, Center for Global Security Research Lawrence Livermore National Laboratory

**Emir José Macari**  
Dean of Engineering and Computer Science, California State University, Sacramento and Director of the California Smart Grid Center

**Patrick Mantey**  
Director, UC Center for Information Technology Research in the Interest of Society (CITRIS), UC Santa Cruz

**Ryan McCarthy**  
2009 CCST Science and Technology Policy Fellow

**Larry Papay**  
CEO, PQR, LLC, mgmt consulting firm

**David E. Winickoff**  
Associate Professor of Bioethics and Society, Department of Environmental Science, Policy and Management, UC Berkeley

**Paul Wright**  
Director, UC Center for Information Technology Research in the Interest of Society (CITRIS)

With additional assistance from:

**JD Stack**  
Administrator, California Smart Grid Center, College of Engineering and Computer Science, California State University, Sacramento

## CCST's pHIT Task Force Moves Toward Project Expansion and Phase II Funding

CCST's Personalized Healthcare Information Technology (pHIT) Task Force has completed a major component of the pHIT pilot study project, gathering all needed input from a four-member Ontology Panel assembled last Spring based on Panel member expertise in oncology, ontology and information technology.

The pHIT pilot study focuses on personalized oncology through development of a clinical support application for breast cancer patients and their health care providers. An objective of the pHIT pilot study, supported by the Ontology Panel of experts, is to retrospectively collect and evaluate de-identified breast cancer patient records from Anthem Blue Cross and genetic/genomic test results from Genomic Health, Inc. and Myriad Genetic Laboratories, Inc. The pHIT pilot study's goal is to develop a scalable prototype healthcare decision support system designed to integrate anonymized patient records with genetic/genomic test results.

In December 2010, the pHIT Task Force received notice that a Letter of Intent submitted last October for supplemental pHIT pilot study funding for Phase II of the pilot study has been approved by the University of California Breast Cancer Research Program. A full proposal will be submitted soon.

The pHIT Task Force Letter of Intent for ONC funding was submitted as a collaborative proposal between CCST's pHIT Task Force and the California Telehealth Network, along with numerous proposal partners. The pHIT Task Force is chaired by Ramesh Rao, director, UCSD Division, California Institute for Telecommunications and Information Technology. The project is being conducted in cooperation with California state agency partners including the Business, Transportation and Housing Agency; the Office of Health Information Integrity (CalOHII), Health and Human Services Agency; and CalPERS.

# CAPITOL HAPPENINGS

Science and Technology Legislation Updates

*Capitol Happenings is a section of the CCST Report that provides a brief summary and update on what is going on in state government, be it new action from the Governor's Office, legislative committees or new legislation.*

## Governor's Budget Proposes First Cuts of Many to Come

On January 10, Governor Brown proposed over \$12.5 billion in spending cuts, a realignment of responsibility and spending back to local governments, and a temporary extension of taxes for the 2011-12 budget, in an effort to address an estimated budget gap of \$25 billion.

"These cuts will be painful, requiring sacrifice from every sector of the state, but we have no choice," Brown said in a prepared statement. "For 10 years, we've had budget gimmicks and tricks that pushed us deep into debt. We must now return California to fiscal responsibility and get our state on the road to economic recovery and job growth."

The long-expected reductions include cuts across the board, including a 3.9% decrease in funding for the California Environmental Protection Agency (CalEPA) and the elimination of the Office of the Secretary of Education.

The state's higher education systems face significant cuts, with reductions of \$500 million in the budgets for both the University of California and the California State University System. The situation is exacerbated by the loss of the additional \$106 million in federal stimulus funding which each system received in 2010-11.

"As we have before, we will need to look at every option in order to develop a comprehensive plan to address a reduction of this magnitude," said CSU Chancellor Charles Reed. "There will inevitably be difficult choices as we move forward, and no single solution will be enough to meet this challenge."

A centerpiece of the Governor's budget proposal is a major realignment of program duties, raising \$5.9 billion in taxes, and shifting \$5.9 billion to counties to implement increased program obligations. To enable counties to manage their increased fiscal responsibilities, the governor's plan proposes giving them increased authority over the realigned programs.

K-12 spending is virtually the only area not facing substantial cuts in the proposed budget.

The proposed reductions are difficult, but likely not the last. The Legislative Analyst's Office called the budget a 'good starting point,' but cautioned that its analyses project continued budget deficits in the \$20 billion range for California through 2015-16.

"We credit the Governor's efforts to craft a budget plan that focuses on multiyear and ongoing solutions, and his proposals to realign state and local program responsibilities and change local economic development efforts have much merit," the LAO noted in its budget overview. "Still, there are some significant risks in his plan and some optimistic savings assumptions."

## Governor's Agenda Includes Focus on Green Energy and STEM Education

In his inaugural address, Governor Brown reiterated his campaign pledge to focus on renewable energy, setting a goal of producing 20,000 megawatts of renewable energy by 2020.

"I intend to meet it by the appointments

I make and the actions they take," said Brown. "There are hundreds of thousands of new jobs to be created if California regulatory authorities make sensible and bold decisions. It will also be necessary to make sure that our laws and rules focus on our most important objectives, minimizing delays and unnecessary costs."

Brown's goal would keep on track the cleaner-energy push begun by Schwarzenegger's administration. The California Energy Commission in recent months has licensed planned solar power plants with a total generating capacity of more than 4,100 megawatts.

In addition, despite the significant budget challenges facing California's education system, Governor Brown has also made science, technology, engineering and math (STEM) education a priority in the agenda for his incoming administration.

"As part of the broader curriculum described above, we need to strengthen STEM teaching and increase the number of STEM graduates," states Brown's education plan. "California's economic growth depends on its continued leadership in innovation, technology, clean energy and other fields that require strong math and science training."

## California Holds Steady According to Milken S&T Index

In January, the Milken Institute issued its State Science and Technology Index for 2010, scoring California 4th once again – the same ranking it held in the 2009 Index.

The Index provides a nationwide benchmark for states to assess their



science and technology capabilities, based on 79 individual indicators. Each indicator is computed and measured relative to population, gross state product (GSP), number of establishments, number of businesses, and other factors. The indicators are subdivided into five main composites: research and development inputs, risk capital and entrepreneurial infrastructure, human capital capacity, and technology and science workforce.

According to Milken's index, California's strengths lie in its entrepreneurial infrastructure, research and development inputs, and technology-derived economic development. California has five of the top 10 technology clusters in the nation, and Silicon Valley (the San Jose metro area) remains the preeminent high-tech cluster in the world. The state also has considerable strength in the newly emerging fields of nanotechnology, clean technology, and green technology, and Milken characterizes California as a "leading innovator in public policy" to support these areas.

California remains weaker in human capital capacity, however, producing fewer graduates in the sciences, engineering, and biomedical fields; its S&T workforce has also suffered from continued outsourcing of computer, semiconductor, and communications equipment manufacturing abroad and to other states.

The three states that were ranked ahead of California by Milken – Massachusetts, Maryland, and Colorado – also held identical rankings last year. However, composite scores for all of the top rated states were slightly down from the previous year. In Milken's first index, issued for 2002, California was ranked third.

## Energy Bills Introduced in 2011-12 Session

Since the new legislative session began, several bills have been introduced concerning the state's energy production, distribution, and research.

**SB 16 (Rubio)** would establish a new program to ease and expedite the state permitting process for renewable energy and transmission projects within the state.

**SB 23 - California Renewable Energy Resources Act (Simitian, Kehoe, and Steinberg)** would establish a division in the California Renewables Portfolio Standard Program with the primary purpose of performing comprehensive planning and environmental compliance services with priority given to projects involving the building of eligible renewable energy resources. The internal division is intended to ensure the timely completion of plans pursuant to the Natural Community Conservation Planning Act.

**SB 142 (Rubio)** is intended to address the lack of interregional parity of single rate structures when applied to differing climate regions. Under existing law, the Public Utilities Commission has regulatory authority over public utilities, including electrical corporations and gas corporations, as defined. Existing law authorizes the commission to fix the rates and charges for every public utility, and requires that those rates and charges be just and reasonable.

**SB 148 – Partnership Academies (Steinberg)** would require the Controller annually to allocate \$8,000,000 from the Energy Resources

Program Account, upon appropriation by the Legislature, to the Superintendent of Public Instruction for expenditure in the form of grants to school districts to fund the Clean Technology and Renewable Energy Job Training, Career Technical Education, and Dropout Prevention Programs.

**AB 37 (Huffman)** would require the California Public Utilities Commission, by January 1, 2012, to identify alternative options for customers of electrical corporations that decline the installation of wireless advanced metering infrastructure devices (smart meters) as part of an approved smart grid deployment plan. The bill would also require the CPUC, when it has identified those alternative options, to require each electrical corporation to permit a customer to decline the installation of an advanced metering infrastructure device and make alternative options available to that customer.

**AB 15 - California Renewable Energy Workforce Readiness Initiative (Perez)** would direct the California Workforce Investment Board (CWIB), by July 1, 2012, in consultation with the Green Collar Jobs Council (GCJC), to establish the California Renewable Energy Workforce Readiness Initiative to ensure green collar career placement and advancement opportunities within California's renewable energy generation, manufacturing, construction, installation, maintenance, and operation sectors. The bill would require that the initiative provide guidance to local workforce investment boards on how to establish comprehensive green collar job assessment, training, and placement programs that reflect the local and regional economies.

## 2010-2011 Science and Technology Policy Fellows are Assigned to Legislative Offices



Left to right: Michelle Leinfelder, Hillary Q. Thomas, Peter Cowan, Kenneth Spence, Anthony Marino, Michael Bedard-Hearn, Newsha Ajami, and Malaika Katrina Singleton Duran

### Senate Offices

**Newsha Ajami** with the Senate Natural Resources & Water Committee. Ajami received a Ph.D. in civil and environmental engineering from the University of California, Irvine, a M.S. in hydrology and water resources from the University of Arizona and a B.S. in civil and environmental engineering from Tehran Polytechnic.

**Peter Cowan** with the Senate Environmental Quality Committee. Cowan received a Ph.D. from the Department of Integrative Biology at the University of California, Berkeley in 2010. He received a M.S. in biological sciences from Stanford University and a B.A. in biology (magna cum laude) from Kalamazoo College.

**Malaika Katrina Singleton Duran** with the Senate Office of Research. Duran received a Ph.D. in neuroscience from the University of California, Davis and a B.A. in biology and psychology that was jointly awarded from Rutgers University-Newark College of Arts & Sciences and the New Jersey Institute of Technology.

**Michelle Leinfelder** with the Senate Transportation & Housing Committee. Leinfelder received a Ph.D. and M.S. from the Department of Horticulture at Cornell University and a B.S. in crop science and management from the University of California, Davis.

### Assembly Offices

**Michael Bedard-Hearn** with the office of Assemblymember Nancy Skinner. Bedard-Hearn received a Ph.D. from the University of California, Los Angeles in physical chemistry, specializing in energy transfer, and a B.S. in chemistry from Santa Clara University.

**Anthony Marino** with the office of Assemblymember Jerry Hill. Marino received a Ph.D. in chemistry from the University of Chicago and a B.A. in English and chemistry from Davidson College.

**Kenneth Spence** with the office of Assemblymember Nathan Fletcher. Spence received a Ph.D. in entomology from the University of California, Davis and a B.S. in biology and Spanish language from Morehouse College.

**Hillary Q. Thomas** with the office of Assemblymember Fiona Ma. Thomas received a Ph.D. and M.S. in entomology from the University of California, Davis, and a B.S. in environmental sciences from the University of California, Berkeley.

## Mim John, Peter Cowhey Named New CCST Chair and Vice Chair

Miriam John, former vice president of the California Division of the Sandia National Laboratories, has been named the new chair of the California Council on Science and Technology effective January 1. Council member Peter Cowhey has been named the new vice chair.

"Mim brings to the position a depth and breadth of experience as a senior executive with Sandia, together with significant advisory roles for Department of Defense agencies," said CCST Board Chair Karl Pister. "I look forward to her tenure as chair."

Prior to her position as vice president at Sandia, John served in a number of managerial and technical roles for the laboratory, whose principal programs include nuclear weapons stewardship, weapons demilitarization, chemical/biological weapons defense, combustion and materials research, advanced lithography development, micro-chemical and remote laser based chemical detection, and distributed, secure advanced computational and information systems. She served two terms as a CCST Council member (2003-2007) and as the Council vice chair from 2008-2010.

Newly appointed vice chair Cowhey is the Qualcomm professor of Communications and Technology Policy and dean at the University of California, San Diego's Graduate School of International Relations and Pacific Studies. For the past year he has also served as senior counselor to the U.S. Trade Representative on strategy



and negotiations, an appointment that concluded in February. Cowhey has been a member of the CCST Council since 2007.

"Peter's presence as vice chair will bring an important balance to the work of the Council, thanks to his distinguished career as a social scientist and academic administrator," said Pister.

John succeeds outgoing Council member Charles F. Kennel, distinguished professor of Atmospheric Science, Scripps Institution of Oceanography; founding director and chairman, International Advisory Board, Environment and Sustainability Initiative, University of California, San Diego. Kennel, who is also a CCST Senior Fellow, served as Council chair from 2008-2010.

## New Board, Council, Senior Fellows and Cal TAC Members

### Board:

**Mory Gharib**, Vice Provost (research), Hans W. Liepmann Professor of Aeronautics and Professor of Bio-Inspired Engineering, California Institute of Technology

**Bruce Margon**, Vice Chancellor for Research and Professor of Astronomy and Astrophysics University of California, Santa Cruz

**Samuel Traina**, Vice Chancellor for Research and Graduate Dean, University of California, Merced

### Council:

**Sally Benson**, Professor (research) of Energy Resources Engineering and Senior Fellow, Precourt Institute for Energy, Stanford University

**Richard Levy**, Chairman of the Board, Varian Medical Systems

### Senior Fellows:

**Jean-Louis Gassée**, Partner, Allegis Capital

**Milton Gordon**, President, California State University Fullerton

### Cal TAC:

**Jeffrey Bradbury**, Chemistry Professor, Cerritos Community College

**Heidi Haugen**, Science Teacher, Florin High School

**Jennifer Howard**, Kindergarten Teacher, Miraloma Elementary School

*Upcoming  
CCST Events*

|   |  |
|---|--|
| <b>May 31 - June 1, 2011</b><br>Sacramento<br>Council meeting<br>and dinner program | <b>October 12 - 13, 2011</b><br>Irvine<br>Board and Council meetings<br>and dinner program |
|---|--|

## Board Member Rollin Richmond Leads Smart Meter Project Team



CCST's analysis of the safety of smart meters was prepared in a matter of months thanks to the many experts who came together to work on the project under the direction of project team chair and CCST Board member Rollin Richmond, president of Humboldt State University.

"It was a pleasure to be part of a team of scientists, engineers, health care providers and CCST's excellent staff to answer a question posed by legislators about the potential health effects of smart meters," said Richmond.

President Richmond, a CCST Board member since 2008, emphasizes that it is the ability to bring together teams of experts such as this one that enables CCST to leverage California's science and technology expertise in a way that is accessible and useful to policymakers.

"CCST brings a bipartisan and scientific approach to issues it addresses," said Richmond. "I believe our report will be especially useful both to the Legislature and to California citizens as it is written for a layperson but uses the criteria of science to reach recommendations."

President Richmond himself has a background in evolutionary genetics. He received his undergraduate degree in zoology from San Diego State University in 1966 and his doctorate in genetics from Rockefeller University in 1971. He then spent 20 years in the Department of Biology at Indiana University and served as chairperson of Biology at Indiana University from 1982-1987. He served as founding dean of the College of Arts and Sciences and professor of biology at the University of South Florida from 1990 until 1995. Richmond became provost at the State University of New York at Stony

Brook and professor of ecology and evolution in 1995 and served until 1999. He served as provost and professor of zoology and genetics at Iowa State University from 1999 until 2002. He was named the sixth president of Humboldt State University in July of 2002.

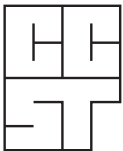
The debate over the safety of smart meters will likely not end with the release of CCST's report. However, the document represents a valuable contribution to the discussion, according to Richmond.

"In situations where public sentiment urges policy makers to make policy decisions with potentially long-term consequences, access to the best information possible is critical," he said. "California's Legislature and its citizens are fortunate to have a group of distinguished academics who are available to provide advice and guidance to our political leaders."

The *CCST Report* focuses on CCST activities and highlights innovative science and technology research and applications in California. The Report is edited by Danny DeCillis, who welcomes information from readers about science and technology at work in the private, public, and education sectors. Layout and graphics by Sandra Vargas. The *Report* thanks CCST members for their generous assistance in providing material for this issue. If you would like more information about CCST initiatives, please contact us at:

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