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The GCCCD is starting a year-long process to develop an Educational Master Plan that will serve as the blueprint for our future. The Educational Master Plan is a long-range, comprehensive document intended to guide institutional and program development at both the college and district levels. The priorities established in the Educational Master Plan will serve to guide College and District decisions about growth, development and resource allocation.

As the first step in this planning process, everyone in the GCCCD community (faculty, staff, students and community members) are invited to identify and submit information sources to be reviewed for the trend analysis in one of six taxonomy areas - society, technology, economy, environment, politics, and education. We are not asking you to do new research - only to identify information you already have or that you encounter during the search period (March 21 - April 25) and bring it to the attention of the Scan Teams for review.

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Questions: lynne.davidson@gcccd.edu *Research, Planning and Institutional Effectiveness*

Educational Master Plan
Information Submission Form

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2) Author: Steven L. Dawson, Nancy E. Lundebjerg, and Caitlin W. Connolly

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or

8) Attach Document Here:

By Steven L. Dawson, Nancy E. Lundebjerg, and Caitlin W. Connolly

Federal and State Policy Strategies for Developing a Quality Eldercare Workforce

Forging a strong quality eldercare workforce will require a strategic team approach among all geriatric specialties to properly implement the Affordable Care Act.

With the passage of the Affordable Care Act (ACA), the paid and unpaid caregivers who serve and support elders achieved modest policy successes. For a workforce relatively unaccustomed to policy achievements, this is cause for considerable celebration.

Such targeted advancements—from enhancement of the Geriatric Academic Career Awards, to new training resources dedicated explicitly to the direct-care workforce—did not occur by chance. It required a series of thoughtful investments, starting years before the Obama Administration chose healthcare reform as its signature legislative initiative. These investments were then advanced through an unprecedented degree of cooperation among providers, professional organizations, consumer and family caregiver organizations, and direct-care worker advocates.

Shaping the Affordable Care Act

Early strategic decisions that eventually shaped the workforce elements of the ACA can be traced back to a wide array of “new models of care.” This experimentation envisioned both different roles for eldercare staff, as well as interdisciplinary team structures cutting across

the professions and caregivers. The new models were created in every type of setting where elders receive care and support. They included the Green House® Project (small-home models of nursing home care emphasizing self-managed

The 2008 IOM report set a precedent when it defined the eldercare team as including not only all professions, but also family caregivers and the direct-care workforce.

teams), Cooperative Home Care Associates (redesigning the training and support of home-care workers), and the Geriatric Resources for Assessment and Care of Elders (home-based, integrated geriatric care).

All of these models shared a critical common characteristic: they each enjoyed significant philanthropic support from major health, aging, and workforce foundations. Indeed, while keeping strictly within their tax-exempt constraints of not directly influencing legislation, philanthropy’s role of informing public policy was central to the eventual inclusion of key eldercare workforce policy innovations within the ACA.

Philanthropy's core role supporting the eldercare workforce is also reflected in the critical decision, dating back to 2006, of the John A. Hartford Foundation and The Atlantic Philanthropies to build a consortium of nine foundations, and of AARP to commission an Institute of Medicine report explicitly on the eldercare workforce. Prior to that, with support from the Hartford and the Robert Wood Johnson Foundations, the American Geriatrics Society produced a report on the *Future of Geriatric Medicine* that, among other things, called for the Institute of Medicine (IOM) to produce a workforce readiness report focused on the care of older adults (Besdine et al., 2005). The resulting report, *Retooling for an Aging America*, set a precedent when it defined the eldercare interdisciplinary team as including not only all professions, but also family caregivers and the direct-care workforce.

Eldercare workforce policy will eventually find its true test at the state level.

The IOM report documented strong evidence in support of “retooling” the eldercare workforce—drawing heavily on the various models of care already tested in the field. Rather than calling for significant additional research, the report made a strong plea for “fundamental reform,” listing a dozen recommendations ranging from explicit support for well-tested models, to enhanced geriatric training. Nor was the report hesitant in requesting significant new investments in wages and benefits for low-paid direct-care workers, as well as for enhanced federal reimbursements to states for more robust eldercare services.

Still, the foundations that funded the IOM retooling report were well aware that a single document—even from a source as prestigious as the IOM—rarely is sufficient to spark policy change. In 2008, the Hartford Foundation and The Atlantic Philanthropies invested in the next

strategic step, funding the formation of a coalition of twenty-eight national organizations called the Eldercare Workforce Alliance (EWA), a project of the Tides Center and The Advocacy Fund). Organized just as healthcare reform was being argued in the halls of Congress, the EWA entered the debate somewhat late, yet still in time to shape and then support several key workforce provisions drawn primarily from the IOM retooling report. Many of these provisions were championed by Wisconsin Senator Herb Kohl, Chairman of the U.S. Senate Special Committee on Aging.

The Future and Its Challenges

The ACA provisions explicitly benefitting the eldercare workforce admittedly were not profound—unsurprising, because the ACA primarily addressed coverage and finance issues, focusing far less on service delivery. Plus, politicians facing a relatively jobless recovery were unlikely to focus five years down the road, to a time of threatened workforce vacancies (Blue-stone and Melnick, 2010). Nonetheless, the targeted eldercare workforce victories within the ACA proved quite useful in directing congressional attention in general toward the needs of elders, and specifically toward the staff and family members who care for them.

Ironically, several other elements embedded in the ACA will, over time, likely have greater impact on the eldercare workforce than the explicit initiatives referenced above. These broader reforms include the following:

- Community Living Assistance Services and Support (CLASS) Act provisions (the late Senator Ted Kennedy's signature reform initiative providing a type of “social insurance” cash benefit for eldercare and disability services);
- The emergence of Accountable Care Organizations—Medicaid funding enhancements encouraging home- and community-based services; and

- Two newly created entities: the Federal Coordinated Health Care Office (FCHCO, focusing on consumers who are dually eligible for both Medicaid and Medicare services) and the Center for Medicare and Medicaid Innovation (“CMI” or “Innovation Center”).

While each will have a profound influence on the future of eldercare delivery, these and other large ACA initiatives are all still remarkably undefined.

Unlike the past few years, when reformers focused on new legislation, the emphasis over the next several years will primarily be on the defense and implementation of already authorized policy. At the federal level, the emphasis will be two-fold: deflecting efforts to dismantle the ACA (either through direct repeal, or by refusal to appropriate required funding); and influencing the crucial rule-making that will breathe specific detail into what currently are only broad legislative constructs. The legislative exceptions that should garner attention at the

federal level will be attempts to reauthorize the Older Americans Act (which shapes the Administration on Aging) and the Workforce Investment Act (which funds most of the Department of Labor’s workforce training system).

However, eldercare workforce policy will eventually find its true test at the state level, where care is received and where staffs actually work. Even acknowledging the promised new federal ACA resources, the current reality of eldercare and disability service systems varying significantly from state to state—and uniquely shaped primarily by each state’s Medicaid policy—will remain unchanged.

Furthermore, states’ budgets are under unprecedented pressure. Forty-eight states are addressing shortfalls in their budgets totaling \$191 billion (McNichol, Oliff, and Johnson, 2010). These state-level budgetary pressures place two very different types of obstacles in the path of workforce implementation. The more obvious is state budgets that will be hard-pressed to keep up with the per capita increase



in demand for eldercare services stemming from the demographic realities of an aging America.

Less obvious is states' staff capacity to manage all this imagined innovation and new systems development—particularly within state-level departments of health and labor, which have been severely weakened by repeated budget cuts (Weil and Scheppach, 2010; The Henry J. Kaiser Family Foundation, 2010). This instability in state infrastructure will be further exacerbated by the recent gubernatorial elections. Twenty-six new governors will be appointing new administrative teams to simultaneously manage both existing programs and a plethora of new ACA-funded initiatives.

The tension is clear: most states will certainly pursue new demonstration and program dollars from the federal government, if only because state coffers are dwindling as the demand for services has risen (Baumrucker and Fernandez, 2010). The Congressional Research Service (in a 2010 memo) outlined several ACA elements that could result in cost savings to states. These include increased federal matching rates for certain long-term services, and expansion of home- and community-based services as an alternative to institutional care. However, such “savings” are often generated by the relatively lower compensation paid to home-based workers, when compared to similar jobs in facility-based settings.

The challenge to policy makers and advocates will be to help states manage these new resources effectively despite the chaos of court challenges to the constitutionality of the ACA and weakened state infrastructures. The goal would be to help states produce the hoped-for innovations in care quality and cost efficiency.

Implementing the Affordable Care Act

Challenged by constrained state budgets, split public opinion about healthcare reform, and political uncertainty over the ACA itself, federal agencies are faced with rolling out the various provisions of the ACA on a very aggressive timeline. Yet despite these challenges, those

implementing healthcare reform—at both the federal and state levels—must acknowledge that the workforce charged with delivering innovative care to frail elders is currently ill-prepared to do so (IOM, 2008). The eldercare workforce elements within the ACA are only one small element in what needs to happen to ensure a competent workforce.

Within the U.S. Department of Health and Human Services, the following three agencies will be critical to ACA implementation, and each must focus on critical workforce issues:

Centers for Medicare and Medicaid Services

From Accountable Care Organizations to demonstration projects under the Innovation Center to the Federal Coordinated Health Care Office to enhancing physician quality reporting: the Centers for Medicare and Medicaid Services (CMS) will have to implement much of the system redesign that is the promise of healthcare reform. The ACA has appropriated more than \$10 billion over ten years for system redesign (U.S. Congress, 2010). To bend the cost curve, the CMS must work to ensure that every element of implementation includes attention to workforce preparedness.

Questions the CMS staff should consider as a part of the design and implementation of all ACA elements include the following:

- Is there a commitment to a team-based approach, with all team members practicing “at the top of their license” and working together to provide well-coordinated care?
- Who is on the team? Are the patient, his or her family, and his or her informal caregivers at the center of the care team?
- Is workforce compensation—a means to increase the stability and efficiency of the eldercare workforce—seen as integral to bending the cost curve?
- Is there training for all members of the team so they are fully competent to deliver eldercare within a redesigned healthcare system?

- Are private sector and state partners (e.g., credentialing and licensing boards, universities, and community colleges) fully engaged and working to ensure the workforce is competent to care for frail elders?
- Are there built-in system incentives for social and medical systems service providers to work together to deliver well-coordinated care?
- Do quality metrics for practitioners and providers recognize the complexity of caring for frail elders with multiple chronic conditions?
- Is the workforce trained to provide culturally competent care that addresses the variety of languages, ethnicities, cultures, and health beliefs of older adults and is it effectively able to serve all older adults regardless of their race, sexual orientation, gender identity, disability status, and geographical location?

Administration on Aging

As of this writing, the Administration on Aging (AoA) will likely be charged with designing how the CLASS Act provisions of the ACA will be implemented. The CLASS provisions will create a new social insurance program self-funded by individuals participating through their employers or electing to participate directly. The premiums individuals pay can be drawn down to support home- and community-based services when needed, increasing with level of need.

Under CLASS provisions, states are required to ensure an infrastructure is in place to support a personal-care-attendant workforce well prepared to care for America's frail elders and those with disabilities. This workforce is one of the fastest growing in the country—PHI projects that we will need 1.1 million additional direct-care workers between 2008 and 2018. As the program is designed, the AoA staff should consider the following:

- How can the role of personal-care attendant be redesigned so it can assume

greater responsibility within the care team for the safety and quality of the services we provide?

- Are effective labor-market intermediaries, such as registries and matching services that help consumers and workers find each other, being created?
- How is the quality of the workforce, including employer practices such as sustainable wages, balanced work hours, benefits, qualifications, competencies, training programs, recruitment practices, and retention strategies being assessed?
- Should standards or guidelines for employment relationships between beneficiaries and personal-care attendants be established?

The upcoming reauthorization of the Older Americans Act (OAA) offers the AoA an opportunity to redesign the services offered through the aging network so they are complementary to the programs being implemented under the ACA. Currently, no agency within the U.S. departments of Health and Human Services and Labor is explicitly responsible for policies and programs to support a stable and qualified long-term-care workforce. Given the sheer size of the direct-care workforce, which will reach more than 4 million workers by 2018, the AoA should work toward the creation of an Inter-agency Coordinating Committee on the Direct-Care Workforce (PHI, 2008). The AoA's leadership in this area is essential, as this workforce is central to its mission of ensuring services for our nation's elders.

Health Resources and Services Administration

The Health Resources and Services Administration (HRSA) is being asked to implement those elements of the ACA that are explicitly workforce-related, including programs targeted at enhancing development of geriatrics faculty and the capacity of geriatrics and gerontology programs to train the entire workforce. The HRSA will also house the National Workforce

Policy Studies Center, which is charged with longitudinal tracking of the workforce.

Also, for the first time in its history, the HRSA will be charged with designing and implementing a program focused on personal-care attendants. The Personal and Home Care Aide State Training Program will provide funding to six states to develop core competencies, pilot training curricula, and certificate programs for personal-care and homecare aides.

The ACA also includes provisions that will expand programs supporting primary care clinicians (e.g., the National Health Service Corps, the primary-care bonus, expansion of primary-care residencies) and community-based services (e.g., the Area Health Education Center Program).

In addition, funding within the ACA for the Prevention and Public Health Fund could be used to support grants to expand and enhance the capacity of the workforce to care for older adults.

Throughout their work on implementation, HRSA staff should consider the following questions:

- How can concepts related to the care of older adults be infused into the training offered through the Area Health Education Centers, as well as through existing primary-care training initiatives overseen by the HRSA?
- How to best allocate funding available within the ACA (e.g., the Prevention and Public Health Fund) to programs focused on preparing a workforce competent to care for older adults?
- How to create incentives, in collaboration with the CMS, for workforce training specifically focused on the unique healthcare needs of older adults?

How Congress Can Support the Eldercare Workforce

Many ACA elements specific to the geriatrics health professions under Title VII and Title VIII—as well as to training of direct-care workers

on the unique healthcare needs of older adults—are unfunded mandates within the ACA. Congress must ensure these programs are adequately funded through the annual appropriations process. In addition, the CMS, AoA, and the HRSA should draw on the special expertise of those with advanced training in geriatrics and gerontology. These experts could advise them on systems design to address the highest cost beneficiaries and prepare the entire workforce to competently care for older Americans.

Congress should also consider enhancements of workforce training during reauthorization of the OAA.

As a benchmark for annual funding of these programs, the Eldercare Workforce Alliance has called on Congress to invest \$71.7 million in fiscal year 2011 in geriatrics health professions and direct-care workforce training programs under Titles VII and VIII of the Public Health Service Act (Eldercare Workforce Alliance, 2010).

Congress should also consider enhancements of workforce training during reauthorization of the OAA, as well as recommendations emerging from the Medicare Payment Advisory Commission (MedPAC). The MedPAC is charged with advising Congress on issues affecting the Medicare program. These include payments to private health plans participating in Medicare and providers in Medicare's traditional fee-for-service program, as well as access to care, quality of care, and other issues affecting Medicare. Recently, MedPAC has begun to look at how graduate medical education dollars are used and how financing basic geriatric competency could benefit older patients (MedPAC, 2010).

An Ongoing Role for Eldercare Workforce Advocates


Advocates for the eldercare workforce can point with some pride to key advancements in workforce policy made under ACA. These

include programs supporting the development of workers with special expertise in caring for older adults, increased training for direct-care workers, and a new form of social insurance supporting elders and their families.

In looking to the future, advocates should be mindful of the need to defend the ground gained under ACA. This will require consistent, interdisciplinary advocacy efforts to ensure funding is appropriated for the geriatrics health professions and other training programs under Title VII and VIII.

At the same time, advocates should pay close attention to the sweeping system redesign that is the promise of ACA. Specifically, eldercare workforce advocates should be attentive to the crucial rule-making already underway at the various agencies charged with implementation: agencies have incorporated ACA provisions into existing programs (e.g., HRSA immediately redesigned the Geriatric Academic Career

Awards to reflect changes under the ACA) and most policy analysts anticipate a very aggressive timeline for rolling out the programs and demonstrations authorized under the ACA.

To date, eldercare workforce advocates should be commended for their ability to work together to articulate with one voice what is needed to ensure we are providing the highest quality care for older Americans. This team approach, the heart of a well-coordinated delivery system, will serve advocates in good stead as ACA moves to implementation. 

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 Steven L. Dawson is president of PHI in the Bronx, N.Y., and founding co-convenor of the Eldercare Workforce Alliance. Nancy E. Lundebjerg, M.P.A., is deputy executive vice president and chief operating officer of the American Geriatrics Society in New York, N.Y., and founding co-convenor of the Eldercare Workforce Alliance. Caitlin W. Connolly, B.A., is project manager of the Eldercare Workforce Alliance, New York, N.Y.

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1) Title: A Critical Look at the Looming Long-Term-Care Workforce Crisis

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By Mary F. Harahan

A Critical Look at the Looming Long-Term-Care Workforce Crisis

To alleviate coming workforce shortages, employers, educational institutions, federal and state policy makers, and consumer advocates must recognize long-term care as a vital component of the larger healthcare market.

Over the past decade, numerous studies have documented a growing long-term-care workforce crisis. These studies have usually focused on the shortages of direct-care workers who provide the great bulk of formal care (Stone and Harahan, 2010; Institute of Medicine, 2008; Health Resources and Services Administration, 2004; Office of the Assistant Secretary for Planning and Evaluation, 2003). Much less attention has been paid to the role and status of licensed professionals who supervise direct-care staff and provide health and ancillary services in long-term-care settings. Shortages of competent and dedicated long-term-care professionals—particularly among licensed nurses—continue to be ubiquitous across all long-term-care sectors. In comparison, the recession has significantly eased the shortage of hospital-based nurses. Between 2007 and 2008, employment of registered nurses (RNs) in hospitals increased by 18 percent—the largest increase in thirty years. During this same period, 50,000 nursing positions were lost in non-hospital settings, including nursing homes and homecare agencies. Hospitals offer a competitive advantage over long-term-care employers because of higher wages, better benefit packages, and more

attractive work schedules (Buerhaus, Auerbach, and Staiger, 2009).

The remainder of this article summarizes the roles and responsibilities of licensed long-term-care professionals, discusses the capacity and commitment of these professionals to meet the increasingly diverse long-term-care needs of a growing older adult population, and suggests reforms to attract and retain high-quality long-term-care professionals.

The Roles of Licensed Long-Term-Care Professionals

Licensed professionals employed by nursing homes, assisted living facilities and home health and personal care agencies include administrators, physicians, nurses, social workers, mental health professionals, and consulting pharmacists.

Physicians

Nursing homes reimbursed by Medicare or Medicaid are required to have a physician medical director to oversee the medical care of residents and participate in the design of residents' care plans. The federal government does not require assisted living facilities and home health agencies to have a medical director,

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although many do. According to recent research, medical directors, usually primary care physicians, devote about 44 percent of their practice to nursing homes. A significant minority have some special training in geriatrics (Caprio, Karuza, and Katz, 2009). The involvement of other physicians in caring for long-term-care patients seems to fade away once an individual is admitted to a long-term-care institution. A 2006 survey conducted by Katz and Karuza found that only one in five self-identified primary care physicians reported any involvement in nursing homes. Those who were involved averaged about two hours per week (Katz and Karuza, 2006). An important factor in physicians' reluctance to work in nursing homes is their fear of medical malpractice and liability risk (Kapp, 2008).

Nursing home and home health administrators

Nursing home and home health administrators are responsible for all aspects of their respective organizations, including supervision and management of staff, and compliance with federal and state regulations. The federal government requires states to license nursing home administrators.

However, there are no national standards, and state licensing requirements vary widely.

Several studies (Singh and Schwab, 2000; Castle, 2001; Castle, 2006) show high rates of administrator turnover in nursing homes. The credentialing of assisted living facility, home health agency, and other home- and community-based service agency administrators is left to states.

The professional nursing workforce

Registered nurses are responsible for assuring the quality of clinical care in long-term-care settings, assessing health conditions, developing treatment plans, and supervising licensed practical nurses (LPNs), licensed vocational nurses (LVNs) and direct-care staff. Of the estimated 3.1 million RNs employed in the

United States, about 260,000 work in long-term-care settings, usually in nursing homes and home health agencies. By law, the director of nursing in a skilled nursing facility must be an RN. Federal regulations also require one licensed nurse on duty in a nursing home twenty-four hours a day, but does not differentiate RNs from LPNs. Home health RNs assess patients' home environments, care for and instruct patients and their families in self-care, and supervise home health aides. The RNs—particularly in nursing homes—are more likely than their hospital-based peers to be in high-level management jobs rather than working to provide direct care.

A substantial body of research supports the critical role of RNs—particularly in nursing home settings—in improving quality of care (Harrington et al., 2000; Rantz, 2003; Reinhard and Reinhard, 2006; Bostick et al., 2006). Unfortunately, turnover among nursing home RNs ranges from 38 percent to 50 percent (Health Resources and Services Administration [HRSA], 2010). Although no one has systematically examined national RN turnover and vacancy rates in home health agencies, a North

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Carolina study found an average annual turnover rate of 29 percent in home health and hospice agencies (Lacey and McNoldy, 2007).

Licensed practical nurses and licensed vocational nurses provide direct patient care, including taking vital signs and administering medications. A recent survey of newly licensed LPNs and LVNs shows that about 64 percent work in nursing homes, 8.6 percent work in assisted living facilities, and 6.9 percent work in home health settings. The LPNs and LVNs working in long-term-care facilities had administrative responsibilities and were six times more likely to be a charge nurse or team leader, than those in hospitals (National

Council of State Boards of Nursing, 2009). LPNs have a shorter, less rigorous path to credentialing than do RNs, typically taking twelve to eighteen months to complete licensing requirements.

Nurse practitioners (NPs) are employed in some nursing homes to augment medical care provided by physicians. The NPs—RNs with advanced training—operate in an expanded nursing role, conducting physical exams, making urgent-care visits, prescribing medications, and providing preventative care to residents. Of the estimated 78,500 nurse practitioners in the United States, only about 2,000 work in nursing homes. An unknown number of NPs are also employed by home-health agencies. Several studies show NPs have a positive impact on nursing home residents' care (Garrard et al., 1990; Rosenfeld et al., 2004).

Social workers and other mental health professionals

Social workers carry out broad and somewhat diffuse functions in long-term-care settings. They address a wide array of problems facing elders and their families, including functional impairment, psychological problems or cognitive impairments, grief and loss, legal and ethical issues, and end-of-life concerns. Federal regulations require nursing homes with more than 120 beds to have a qualified social worker. Approximately 7.6 percent to 9.4 percent of all professional social workers are employed in long-term-care settings (Office of the Assistant Secretary for Planning and Evaluation [ASPE], 2006). Social workers also provide medical social services to frail and disabled elders under Medicare's home-health benefit, if provided in conjunction with treating social and emotional problems affecting a patient's medical condition.

There is a severe shortage of other mental health professionals in long-term-care settings—those trained in psychiatry, psychology, and nursing who can provide mental health services to older adults. The number and range of psychiatric services in nursing homes is generally

provided by psychiatric consultants hired to address specific short-term patient needs, and who typically provide no follow-up care (Bartels, Moak, and Dum, 2002). A review of medical records by the Office of the Inspector General (2003) in a sample of skilled nursing facilities showed that 95 percent of Medicare beneficiaries who received a psychosocial assessment had at least one psychosocial service need. However, 39 percent did not have a care plan.

Consultant pharmacists and senior-care pharmacists

Consultant pharmacists and senior-care pharmacists take responsibility for patient medication-related needs in nursing homes and other long-term-care settings. They ensure that medications are appropriate, effective, and safe; oversee correct use of medications; and identify and resolve medication-related problems (American Society of Consultant Pharmacists, 2008).

The Capacity and Commitment of the Professional Long-Term-Care Geriatric Workforce

A number of factors explain why more physicians, nurses, social workers, and other healthcare professionals are not attracted to long-term care, why those recruited often leave, and why experts anticipate continuing shortfalls in the future.

First, healthcare professionals—typically trained to work in acute and primary care—are not prepared to tackle the unique aspects of long-term-care practice. These include a lack of knowledge about and experience with long-term care's strict regulatory environment (based on survey and certification, and the required use of the minimum data set and Old Age Social and Income Security). Functional assessment skills—critical in long-term care—are not given high priority in most professional training. Relatively few professionals are prepared to manage large numbers of unlicensed direct-care staff who provide the lion's share of services in long-term care. Most

professionals, furthermore, are not sufficiently prepared to work in the home healthcare sector, where one-to-one relationships between providers and clients prevail. Finally, these individuals are not trained to manage the multiple transitions between the home, hospital, and skilled nursing facility that much of the elderly long-term-care population experiences.

There is a severe shortage of those trained in psychiatry, psychology, and nursing who can provide mental health services to older adults.

Second, the education and training system fails to prepare the professional workforce to care for a largely geriatric long-term-care population. Every medical school requires students to complete a clinical rotation in pediatric settings; however, almost no medical schools require a geriatric rotation. Less than 10 percent even require students to take a geriatrics course. Baccalaureate-level nursing programs rarely expose students to the geriatric care needed by long-term-care clients. (Kovner, Mezey, and Harrington, 2007). About 80 percent of students graduating with a bachelor's degree in social work have never had a course in aging (ASPE, 2006), and master's degree students specializing in gerontological social work are rare.

Third, compensation and benefits for long-term-care professionals are not competitive with the acute-care sector. Recent salary surveys show, for example, that long-term-care RNs make about \$10,000 less per year than acute-care nurses (McConnell, Lekan, and Corazzini, 2010). Geriatricians have the lowest median salary among medical specialties in the United States. As a result, the number of doctors certified in geriatric medicine is declining. The costs associated with the extra years required to become a certified geriatrician do not translate into additional income (ADGAP, 2008).

Fourth, the organization and management of the long-term-care workplace discourages

professional recruitment and retention, particularly with nurses. Despite the fact that consensus-style management has been linked to lower staff turnover in long-term care (Donoghue and Castle, 2009), top-down, hierarchical management continues to be the norm in nursing homes and other care settings. Nurses report a lack of respect and a lack of acknowledgment about

the important roles they play. Workflow, job design, and scheduling are often inflexible, further contributing to a dysfunctional work environment where burdensome

paperwork has replaced hands-on care. Nurses are poorly trained for managing the increased racial and ethnic diversity among staff and clients. Career advancement opportunities are few, and performance incentives are negligible.

Finally, without serious interventions, the challenge of recruiting and retaining long-term-care professionals is likely to escalate in the face of demands placed on the system by recent healthcare reform legislation. With millions of newly insured individuals entering the healthcare marketplace, a first priority will be to attract healthcare professionals into acute and primary care—not to long-term care.

Recommendations for Developing a Quality Professional Long-Term-Care Workforce

The development of a quality long-term-care workforce first requires that all of the essential stakeholders—employers, educational institutions, federal and state policy makers, and consumer advocates—recognize long-term care as a critical and unique component of the larger healthcare market. These stakeholders must be willing to work collaboratively as a coalition, rather than as competitors and adversaries, to change policy and practice and achieve real reforms. With these basic tenets as the framework, the following actions should be taken:

1. We need to shake up and reinvent the formal system of education, licensing, and

continuing education of long-term-care professionals. A 2007–2008 Commonwealth Fund Long-Term Care Opinion Leader Survey of more than 1,000 providers, consumer advocates, public policy officials, and policy experts asked respondents to rank the most effective options for increasing the proportion of trained professionals in long-term care. Highest ranked were providing educational assistance to individuals considering geriatrics, increasing the emphasis on geriatrics within the long-term-care context in the curriculum of professional schools and other training venues, and providing viable clinical placements to expose students to the world of long-term care (Miller, Mor, and Clark, 2010).

2. Reforming the education and training system cannot be separated from the need to strengthen competencies of long-term-care professionals. In their review of efforts to improve competencies needed by long-term-care professionals, Harahan and Stone (2009b) concluded that competencies were much less developed, and in some cases nonexistent, when compared with similar efforts to develop competencies of the healthcare workforce employed in hospitals and ambulatory-care settings. Based on these findings, a national group of long-term-care workforce experts called for establishing a national work group (AAHSA, 2010) to do the following:

- synthesize existing geriatric and gerontological core competencies, developed for the overall healthcare workforce, for modification and adoption to licensed professionals in long-term-care settings;
- synthesize core competencies, including culture change competencies, for long-term-care disciplines, and create specialized enhanced competencies for each discipline and each unique long-term-care setting;
- disseminate results to external stakeholders for feedback, and build consensus among the principal stakeholders on the specific competencies; and

- incorporate competencies into the curricula of schools of nursing, medicine, social work, and continuing-education providers.

3. There must be an increase in the compensation of long-term-care professionals to achieve parity with the acute-care sector. Without parity, long-term care will continue to have second-class status and shortages of high-quality personnel will persist. A first step could be to track the competitiveness of long-term-care providers in local healthcare labor markets and establish rate-setting guidelines in line with local labor market conditions.

4. The dramatic growth in the proportion of older adults in the United States will require the development of new models of care that use professional staff in different ways. A new model—the Nursing Home Physician Specialist—designed to attract greater numbers of nursing home physicians, would create a nursing home medicine specialty recognizing the nursing home as a unique practice site (Katz et al., 2009).

Compensation of long-term-care professionals must be increased to achieve parity with the acute-care sector.

Patterned after the hospitalist movement, nursing home specialists would devote a substantial percentage of their practice to nursing home care; become proficient in specific competencies such as frailty, transitions of care, and cognitive and behavioral disorders; and adopt a closed staffing model. Given the fact that challenges to recruiting physicians into long-term care are expected to continue, greater numbers of physician assistants and nurse practitioners could assume much of these responsibilities in long-term-care settings over the next three decades. To address RN shortages, nurses' state-level, scope-of-practice regulations could be modified to formalize more responsibility for LVNs employed in long-term care.

5. Most professional geriatric workforce development has focused on those trained for, or employed in, the acute-care sector. Research is needed on the roles, requirements, and performance of long-term-care professionals and the combination of education, training, financial incentives, and workplace redesign to develop

and sustain a quality professional workforce now, and in the future. 

.....
 Mary F. Harahan is a senior advisor, Institute for the Future of Aging Services, at LeadingAge (formerly American Association of Homes and Services for the Aging), in Washington, D.C.

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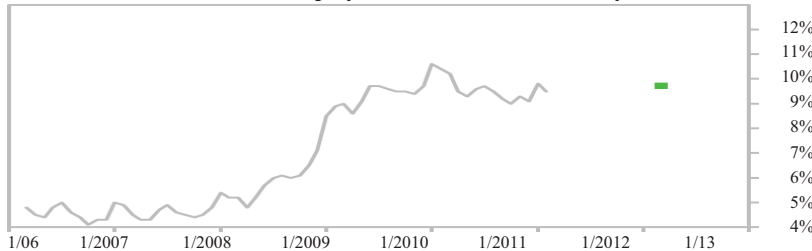
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US National Unemployment rate Forecast			
Target Month	Forecast	HDTFA	Forecast for US National Unemployment rate for the target month indicated. Measurement is in Percent (not seasonally adjusted).
March 2012	9.7%	1.8%	
Updated Wednesday, March 23, 2011.			

US National Unemployment rate - 5 Year History



Monthly US National Unemployment rate is plotted in gray. The forecast for the target month is shown in green. Other links related to this economic indicator are below.

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Are You Unemployed?

A note of encouragement from the Editor:

After my son turned sixteen, I told him it was time to get a job. It was summer and jobs were hard to find. The unemployment rate was about 6% at the time. But the unemployment rate for teenagers was 19.5%! The summer is the hardest time of the year for a teenager to find a job. The kids who held the jobs during the school year want more hours, since school is out and they have more time on their hands. There is also an increase in applications from the students who didn't work during the school year but want a summer job. **On a Monday, I told my 16 year old to apply for ten jobs every day** until he got one. He said he couldn't come up with ten places to apply.

He applied for ten jobs per day for five days. **He received a job on application number forty-five**, the following Friday. He was a busboy at a pizza parlor that summer.

My son graduated from college in May of 2009. The economy was in turmoil. The unemployment rate was nearly 10%. The seniors in his class were not finding jobs. This is what I told him:

“I lived through times like these during the Oil & Gas and Real Estate Depression that occurred in Texas during the 1980’s. That’s when oil prices fell to \$9 per barrel! The Texas unemployment rate rose to 9.3%. Almost every major Texas bank was unable to continue and was taken over by an out of state bank. Most of the companies in my industry did not survive.” I said...
“Expect to call one thousand companies to find a job!”

He contacted about three companies per day. Most were not hiring. Many laughed when he asked if they were hiring. He applied to those which were accepting applications. He lived like a Gypsy on a shoestring, expected success and never asked me for a penny. **It took two hundred phone calls to find a job**, in his field, with a fast growing company that has a wonderful corporate environment. The job was three hundred miles from his preferred location, but he loves his job! The search took two months.

What’s the lesson? Many become discouraged after a series of failed attempts and stop trying. Never give up! Expect it to be hard. Expect success.

If you need free help with discouragement, click [here](#).

J. C. Phillips
 Editor of ForecastChart.com

US Unemployment Rate							
Year	Percent	Year	Percent	Year	Percent	Year	Percent
1948	3.8	1968	3.6	1988	5.5	2008	5.8
1949	6.1	1969	3.5	1989	5.3	2009	9.3
1950	5.2	1970	5.0	1990	5.6	2010	9.6
1951	3.3	1971	6.0	1991	6.9		
1952	3.0	1972	5.6	1992	7.5		
1953	2.9	1973	4.9	1993	6.9		
1954	5.6	1974	5.6	1994	6.1		
1955	4.4	1975	8.5	1995	5.6		
1956	4.1	1976	7.7	1996	5.4		
1957	4.3	1977	7.1	1997	4.9		
1958	6.8	1978	6.1	1998	4.5		
1959	5.5	1979	5.9	1999	4.2		
1960	5.5	1980	7.2	2000	4.0		
1961	6.7	1981	7.6	2001	4.7		
1962	5.6	1982	9.7	2002	5.8		
1963	5.6	1983	9.6	2003	6.0		
1964	5.2	1984	7.5	2004	5.5		
1965	4.5	1985	7.2	2005	5.1		
1966	3.8	1986	7.0	2006	4.6		
1967	3.8	1987	6.2	2007	4.6		

Average US Unemployment Rate is shown in this table: 1948 to present

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Current Unemployment Rate News:

Commentary 6017
February, 2011 Data:

The forecast for the US unemployment rate is in the table at the top of this page. ForecastChart.com is forecasting that US unemployment rates will be roughly 9.72% over the next year. The table shows a HDTFA of 1.78% which suggests that US inflation for the 12 months ending March, 2012 could easily fall between 11.50% and 7.95%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in February, 2011 was 9.50%. That's 0.30% percent lower than the January, 2011 unemployment rate of 9.80%. It is 0.90% percent lower than the February, 2010 unemployment rate of 10.40%. The fall in unemployment rates from January to February indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in March, 2011 that is close to 9.20%.

The US unemployment rate one year ago was 10.40%. The average rate over the last year was 9.48%. The average rate over the last 10 years was 6.18%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.73%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in February of 2011 are high relative to the historical 5.73% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX (Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2010-03	11.2%
2010-04	10.0%
2010-05	9.4%
2010-06	9.4%
2010-07	9.2%
2010-08	9.1%
2010-09	9.0%
2010-10	8.7%
2010-11	9.3%
2010-12	9.6%
2011-01	10.2%
2011-02	10.0%

Unemployment Rates: Females 20 Years & Over

2010-03	7.9%
2010-04	7.7%
2010-05	7.8%
2010-06	8.0%
2010-07	8.6%
2010-08	8.6%
2010-09	8.1%
2010-10	7.9%
2010-11	8.1%
2010-12	7.5%
2011-01	8.1%
2011-02	7.9%

Unemployment Rates: Teenagers (16-19)

2010-03	25.3%
2010-04	23.9%
2010-05	26.8%
2010-06	29.0%
2010-07	26.5%
2010-08	25.1%
2010-09	25.8%
2010-10	26.8%
2010-11	24.3%
2010-12	23.5%
2011-01	26.3%
2011-02	24.1%

Unemployment Rates: Total U. S.

2010-03	10.2%
2010-04	9.5%
2010-05	9.3%
2010-06	9.6%
2010-07	9.7%
2010-08	9.5%
2010-09	9.2%
2010-10	9.0%
2010-11	9.3%
2010-12	9.1%
2011-01	9.8%
2011-02	9.5%

UNEMPLOYMENT RATES BY STATE

January, 2011, Seasonally Adjusted

3.8%	North Dakota
4.2%	Nebraska
4.7%	South Dakota
5.6%	New Hampshire
5.7%	Vermont
6.1%	Iowa
6.3%	Hawaii
6.3%	Wyoming
6.5%	Virginia
6.6%	Oklahoma
6.7%	Minnesota
6.8%	Kansas
7.2%	Maryland
7.4%	Wisconsin
7.5%	Maine
7.5%	Montana
7.6%	Utah
7.7%	Alaska
7.8%	Arkansas
7.8%	Louisiana
8.2%	Pennsylvania
8.3%	Massachusetts
8.3%	New York
8.3%	Texas
8.5%	Delaware
8.7%	New Mexico
9.0%	Connecticut
9.0%	Illinois
9.1%	Colorado
9.1%	Indiana
9.1%	New Jersey
9.1%	Washington
9.3%	Alabama
9.4%	Ohio
9.5%	Tennessee
9.6%	Arizona
9.6%	District Of Columbia
9.6%	Missouri
9.6%	West Virginia

9.7%	Idaho
9.9%	North Carolina
10.1%	Mississippi
10.4%	Georgia
10.4%	Kentucky
10.4%	Oregon
10.5%	South Carolina
10.7%	Michigan
11.3%	Rhode Island
11.9%	Florida
12.4%	California
14.2%	Nevada

Commentary 5941
January, 2011 Data:

The forecast for the US unemployment rate is in the table at the top of this page. ForecastChart.com is forecasting that US unemployment rates will be roughly 9.59% over the next year. The table shows a HDTFA of 1.75% which suggests that US inflation for the 12 months ending February, 2012 could easily fall between 11.34% and 7.84%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in January, 2011 was 9.80%. That's 0.70% percent higher than the December, 2010 unemployment rate of 9.10%. It is 0.80% percent lower than the January, 2010 unemployment rate of 10.60%. The rise in unemployment rates from December to January indicates that the short term unemployment rate trend has been up. If that trend continues, we should see an unemployment rate in February, 2011 that is close to 10.50%.

The US unemployment rate one year ago was 10.60%. The average rate over the last year was 9.55%. The average rate over the last 10 years was 6.14%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.72%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in January of 2011 are high relative to the historical 5.72% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX
(Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2010-02	11.5%
2010-03	11.2%
2010-04	10.0%
2010-05	9.4%
2010-06	9.4%
2010-07	9.2%
2010-08	9.1%
2010-09	9.0%
2010-10	8.7%
2010-11	9.3%
2010-12	9.6%
2011-01	10.2%

Unemployment Rates: Females 20 Years & Over

2010-02	8.0%
2010-03	7.9%
2010-04	7.7%
2010-05	7.8%
2010-06	8.0%
2010-07	8.6%
2010-08	8.6%
2010-09	8.1%
2010-10	7.9%
2010-11	8.1%
2010-12	7.5%
2011-01	8.1%

Unemployment Rates: Teenagers (16-19)

2010-02	25.8%
2010-03	25.3%
2010-04	23.9%
2010-05	26.8%
2010-06	29.0%
2010-07	26.5%
2010-08	25.1%
2010-09	25.8%
2010-10	26.8%
2010-11	24.3%
2010-12	23.5%
2011-01	26.3%

Unemployment Rates: Total U. S.

2010-02	10.4%
2010-03	10.2%
2010-04	9.5%
2010-05	9.3%
2010-06	9.6%
2010-07	9.7%
2010-08	9.5%
2010-09	9.2%
2010-10	9.0%
2010-11	9.3%
2010-12	9.1%
2011-01	9.8%

UNEMPLOYMENT RATES BY STATE

December, 2010, Seasonally Adjusted
3.8% North Dakota

US Unemployment Rate Forecast

4.4%	Nebraska
4.6%	South Dakota
5.5%	New Hampshire
5.8%	Vermont
6.3%	Iowa
6.4%	Hawaii
6.4%	Wyoming
6.7%	Virginia
6.8%	Kansas
6.8%	Oklahoma
7.0%	Minnesota
7.2%	Montana
7.3%	Maine
7.4%	Maryland
7.5%	Utah
7.5%	Wisconsin
7.9%	Arkansas
8.0%	Louisiana
8.1%	Alaska
8.2%	Massachusetts
8.2%	New York
8.3%	Texas
8.5%	Delaware
8.5%	New Mexico
8.5%	Pennsylvania
8.8%	Colorado
9.0%	Connecticut
9.1%	Alabama
9.1%	New Jersey
9.3%	Illinois
9.3%	Washington
9.4%	Arizona
9.4%	Tennessee
9.5%	Idaho
9.5%	Indiana
9.5%	Missouri
9.6%	Ohio
9.6%	West Virginia
9.7%	District Of Columbia
9.8%	North Carolina
10.1%	Mississippi
10.2%	Georgia
10.3%	Kentucky
10.6%	Oregon
10.7%	South Carolina
11.5%	Rhode Island
11.7%	Michigan
12.0%	Florida
12.5%	California
14.5%	Nevada

Commentary 5331
December, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. ForecastChart.com is forecasting that US unemployment rates will be roughly 9.56% over the next year. The table shows a HDTFA of 1.74% which suggests that US inflation for the 12 months ending January, 2012 could easily fall between 11.31% and 7.82%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in December, 2010 was 9.10%. That's 0.20% percent lower than the November, 2010 unemployment rate of 9.30%. It is 0.60% percent lower than the December, 2009 unemployment rate of 9.70%. The fall in unemployment rates from November to December indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in January, 2011 that is close to 8.90%.

The US unemployment rate one year ago was 9.70%. The average rate over the last year was 9.62%. The average rate over the last 10 years was 6.10%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.72%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in December of 2010 are high relative to the historical 5.72% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX (Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2010-01	11.6%
2010-02	11.5%
2010-03	11.2%
2010-04	10.0%
2010-05	9.4%
2010-06	9.4%
2010-07	9.2%
2010-08	9.1%
2010-09	9.0%
2010-10	8.7%
2010-11	9.3%
2010-12	9.6%

Unemployment Rates: Females 20 Years & Over

2010-01	8.0%
2010-02	8.0%
2010-03	7.9%
2010-04	7.7%
2010-05	7.8%
2010-06	8.0%
2010-07	8.6%
2010-08	8.6%

2010-09 8.1%
 2010-10 7.9%
 2010-11 8.1%
 2010-12 7.5%

Unemployment Rates: Teenagers (16-19)

2010-01 26.9%
 2010-02 25.8%
 2010-03 25.3%
 2010-04 23.9%
 2010-05 26.8%
 2010-06 29.0%
 2010-07 26.5%
 2010-08 25.1%
 2010-09 25.8%
 2010-10 26.8%
 2010-11 24.3%
 2010-12 23.5%

Unemployment Rates: Total U. S.

2010-01 10.6%
 2010-02 10.4%
 2010-03 10.2%
 2010-04 9.5%
 2010-05 9.3%
 2010-06 9.6%
 2010-07 9.7%
 2010-08 9.5%
 2010-09 9.2%
 2010-10 9.0%
 2010-11 9.3%
 2010-12 9.1%

UNEMPLOYMENT RATES BY STATE

December, 2010, Seasonally Adjusted

3.8% North Dakota
 4.4% Nebraska
 4.6% South Dakota
 5.5% New Hampshire
 5.8% Vermont
 6.3% Iowa
 6.4% Hawaii
 6.4% Wyoming
 6.7% Virginia
 6.8% Kansas
 6.8% Oklahoma
 7.0% Minnesota
 7.2% Montana
 7.3% Maine
 7.4% Maryland
 7.5% Utah
 7.5% Wisconsin
 7.9% Arkansas
 8.0% Louisiana
 8.1% Alaska
 8.2% Massachusetts
 8.2% New York
 8.3% Texas
 8.5% Delaware
 8.5% New Mexico
 8.5% Pennsylvania
 8.8% Colorado
 9.0% Connecticut
 9.1% Alabama
 9.1% New Jersey
 9.3% Illinois
 9.3% Washington
 9.4% Arizona
 9.4% Tennessee
 9.5% Idaho

9.5%	Indiana
9.5%	Missouri
9.6%	Ohio
9.6%	West Virginia
9.7%	District Of Columbia
9.8%	North Carolina
10.1%	Mississippi
10.2%	Georgia
10.3%	Kentucky
10.6%	Oregon
10.7%	South Carolina
11.5%	Rhode Island
11.7%	Michigan
12.0%	Florida
12.5%	California
14.5%	Nevada

Commentary 5255

November, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. ForecastChart.com is forecasting that US unemployment rates will be roughly 9.93% over the next year. The table shows a HDTFA of 1.81% which suggests that US inflation for the 12 months ending December, 2011 could easily fall between 11.75% and 8.12%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in November, 2010 was 9.30%. That's 0.30% percent higher than the October, 2010 unemployment rate of 9.00%. It is 0.10% percent lower than the November, 2009 unemployment rate of 9.40%. The rise in unemployment rates from October to November indicates that the short term unemployment rate trend has been up. If that trend continues, we should see an unemployment rate in December, 2010 that is close to 9.60%.

The US unemployment rate one year ago was 9.40%. The average rate over the last year was 9.67%. The average rate over the last 10 years was 6.05%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted

accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.71%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in November of 2010 are high relative to the historical 5.71% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX
(Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2009-12	10.4%
2010-01	11.6%
2010-02	11.5%
2010-03	11.2%
2010-04	10.0%
2010-05	9.4%
2010-06	9.4%
2010-07	9.2%
2010-08	9.1%
2010-09	9.0%
2010-10	8.7%
2010-11	9.3%

Unemployment Rates: Females 20 Years & Over

2009-12	7.6%
2010-01	8.0%
2010-02	8.0%
2010-03	7.9%
2010-04	7.7%
2010-05	7.8%
2010-06	8.0%
2010-07	8.6%
2010-08	8.6%
2010-09	8.1%
2010-10	7.9%
2010-11	8.1%

Unemployment Rates: Teenagers (16-19)

2009-12	24.8%
2010-01	26.9%
2010-02	25.8%
2010-03	25.3%
2010-04	23.9%
2010-05	26.8%
2010-06	29.0%
2010-07	26.5%
2010-08	25.1%
2010-09	25.8%
2010-10	26.8%
2010-11	24.3%

Unemployment Rates: Total U. S.

2009-12	9.7%
2010-01	10.6%
2010-02	10.4%
2010-03	10.2%
2010-04	9.5%
2010-05	9.3%
2010-06	9.6%
2010-07	9.7%
2010-08	9.5%
2010-09	9.2%

2010-10 9.0%
2010-11 9.3%

UNEMPLOYMENT RATES BY STATE

November, 2010, Seasonally Adjusted

3.8%	North Dakota
4.5%	South Dakota
4.6%	Nebraska
5.4%	New Hampshire
5.7%	Vermont
6.4%	Hawaii
6.6%	Iowa
6.6%	Wyoming
6.8%	Kansas
6.8%	Virginia
6.9%	Oklahoma
7.1%	Minnesota
7.2%	Montana
7.3%	Maine
7.4%	Maryland
7.5%	Utah
7.6%	Wisconsin
7.9%	Arkansas
8.0%	Alaska
8.2%	Louisiana
8.2%	Massachusetts
8.2%	Texas
8.3%	New York
8.4%	Delaware
8.5%	New Mexico
8.6%	Colorado
8.6%	Pennsylvania
9.0%	Alabama
9.0%	Connecticut
9.2%	New Jersey
9.2%	Washington
9.3%	West Virginia
9.4%	Arizona
9.4%	Idaho
9.4%	Missouri
9.4%	Tennessee
9.6%	Illinois
9.7%	North Carolina
9.8%	District Of Columbia
9.8%	Indiana
9.8%	Ohio
9.9%	Mississippi
10.1%	Georgia
10.2%	Kentucky
10.6%	Oregon
10.6%	South Carolina
11.6%	Rhode Island
12.0%	Florida
12.4%	California
12.4%	Michigan
14.3%	Nevada

Commentary 5179

October, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. ForecastChart.com is forecasting that US unemployment rates will be roughly 9.95% over the next year. The table shows a HDTFA of 1.81% which suggests that US inflation for the 12 months ending November, 2011 could easily fall between 11.76% and 8.14%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in October, 2010 was 9.00%. That's 0.20% percent lower than the September, 2010 unemployment rate of 9.20%. It is 0.50% percent lower than the October, 2009 unemployment rate of 9.50%. The fall in unemployment rates from September to October indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in November, 2010 that is close to 8.80%.

The US unemployment rate one year ago was 9.50%. The average rate over the last year was 9.68%. The average rate over the last 10 years was 6.01%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.71%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in October of 2010 are high relative to the historical 5.71% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX (Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2009-11	9.7%
2009-12	10.4%
2010-01	11.6%
2010-02	11.5%
2010-03	11.2%
2010-04	10.0%
2010-05	9.4%
2010-06	9.4%
2010-07	9.2%
2010-08	9.1%
2010-09	9.0%
2010-10	8.7%

Unemployment Rates: Females 20 Years & Over

2009-11 7.6%
2009-12 7.6%
2010-01 8.0%
2010-02 8.0%
2010-03 7.9%
2010-04 7.7%
2010-05 7.8%
2010-06 8.0%
2010-07 8.6%
2010-08 8.6%
2010-09 8.1%
2010-10 7.9%

Unemployment Rates: Teenagers (16-19)

2009-11 26.6%
2009-12 24.8%
2010-01 26.9%
2010-02 25.8%
2010-03 25.3%
2010-04 23.9%
2010-05 26.8%
2010-06 29.0%
2010-07 26.5%
2010-08 25.1%
2010-09 25.8%
2010-10 26.8%

Unemployment Rates: Total U. S.

2009-11 9.4%
2009-12 9.7%
2010-01 10.6%
2010-02 10.4%
2010-03 10.2%
2010-04 9.5%
2010-05 9.3%
2010-06 9.6%
2010-07 9.7%
2010-08 9.5%
2010-09 9.2%
2010-10 9.0%

UNEMPLOYMENT RATES BY STATE

October, 2010, Seasonally Adjusted

3.8% North Dakota
4.5% South Dakota
4.7% Nebraska
5.4% New Hampshire
5.7% Vermont
6.4% Hawaii
6.7% Iowa
6.7% Kansas
6.7% Wyoming
6.8% Virginia
6.9% Oklahoma
7.1% Minnesota
7.3% Montana
7.4% Maine
7.4% Maryland
7.6% Utah
7.8% Arkansas
7.8% Wisconsin
7.9% Alaska
8.1% Louisiana
8.1% Massachusetts
8.1% Texas
8.3% Delaware
8.3% New York
8.4% Colorado
8.4% New Mexico
8.8% Pennsylvania

8.9%	Alabama
9.1%	Connecticut
9.1%	Idaho
9.1%	Washington
9.2%	New Jersey
9.3%	West Virginia
9.4%	Missouri
9.4%	Tennessee
9.5%	Arizona
9.6%	North Carolina
9.7%	District Of Columbia
9.7%	Mississippi
9.8%	Illinois
9.9%	Georgia
9.9%	Indiana
9.9%	Ohio
10.0%	Kentucky
10.5%	Oregon
10.7%	South Carolina
11.4%	Rhode Island
11.9%	Florida
12.4%	California
12.8%	Michigan
14.2%	Nevada

Commentary 4569
September, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. ForecastChart.com is forecasting that US unemployment rates will be roughly 10.22% over the next year. The table shows a HDTFa of 1.86% which suggests that US inflation for the 12 months ending October, 2011 could easily fall between 12.08% and 8.36%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in September, 2010 was 9.20%. That's 0.30% percent lower than the August, 2010 unemployment rate of 9.50%. It is 0.30% percent lower than the September, 2009 unemployment rate of 9.50%. The fall in unemployment rates from August to September indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in October, 2010 that is close to 8.90%.

The US unemployment rate one year ago was 9.50%. The average rate over

the last year was 9.72%. The average rate over the last 10 years was 5.96%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.70%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in September of 2010 are high relative to the historical 5.70% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX (Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2009-10	9.6%
2009-11	9.7%
2009-12	10.4%
2010-01	11.6%
2010-02	11.5%
2010-03	11.2%
2010-04	10.0%
2010-05	9.4%
2010-06	9.4%
2010-07	9.2%
2010-08	9.1%
2010-09	9.0%

Unemployment Rates: Females 20 Years & Over

2009-10	7.8%
2009-11	7.6%
2009-12	7.6%
2010-01	8.0%
2010-02	8.0%
2010-03	7.9%
2010-04	7.7%
2010-05	7.8%
2010-06	8.0%
2010-07	8.6%
2010-08	8.6%
2010-09	8.1%

Unemployment Rates: Teenagers (16-19)

2009-10	25.6%
2009-11	26.6%
2009-12	24.8%
2010-01	26.9%
2010-02	25.8%
2010-03	25.3%
2010-04	23.9%
2010-05	26.8%
2010-06	29.0%
2010-07	26.5%
2010-08	25.1%
2010-09	25.8%

Unemployment Rates: Total U. S.

2009-10	9.5%
2009-11	9.4%
2009-12	9.7%
2010-01	10.6%
2010-02	10.4%
2010-03	10.2%

2010-04	9.5%
2010-05	9.3%
2010-06	9.6%
2010-07	9.7%
2010-08	9.5%
2010-09	9.2%

UNEMPLOYMENT RATES BY STATE

September, 2010, Seasonally Adjusted

3.7%	North Dakota
4.4%	South Dakota
4.6%	Nebraska
5.5%	New Hampshire
5.8%	Vermont
6.3%	Hawaii
6.6%	Kansas
6.8%	Iowa
6.8%	Virginia
6.8%	Wyoming
6.9%	Oklahoma
7.0%	Minnesota
7.4%	Montana
7.5%	Maryland
7.5%	Utah
7.7%	Arkansas
7.7%	Maine
7.8%	Alaska
7.8%	Louisiana
7.8%	Wisconsin
8.1%	Texas
8.2%	Colorado
8.2%	New Mexico
8.3%	New York
8.4%	Delaware
8.4%	Massachusetts
8.9%	Alabama
9.0%	Idaho
9.0%	Pennsylvania
9.0%	Washington
9.1%	Connecticut
9.2%	West Virginia
9.3%	Missouri
9.4%	New Jersey
9.4%	Tennessee
9.6%	North Carolina
9.7%	Arizona
9.8%	District Of Columbia
9.8%	Mississippi
9.9%	Illinois
10.0%	Georgia
10.0%	Ohio
10.1%	Indiana
10.1%	Kentucky
10.6%	Oregon
11.0%	South Carolina
11.5%	Rhode Island
11.9%	Florida
12.4%	California
13.0%	Michigan
14.4%	Nevada

Commentary 4493

August, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. We are forecasting that US unemployment rates will be roughly 9.79% over the next year. The table shows a HDTFA of 1.79% which suggests that US inflation for the 12 months ending September, 2011 could easily fall between 11.57% and 8.00%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in August, 2010 was 9.50%. That's 0.20% percent lower than the July, 2010 unemployment rate of 9.70%. It is 0.10% percent lower than the August, 2009 unemployment rate of 9.60%. The fall in unemployment rates from July to August indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in September, 2010 that is close to 9.30%.

The US unemployment rate one year ago was 9.60%. The average rate over the last year was 9.74%. The average rate over the last 10 years was 5.92%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.70%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in August of 2010 are high relative to the historical 5.70% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX (Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2009-09	9.5%
2009-10	9.6%
2009-11	9.7%
2009-12	10.4%
2010-01	11.6%
2010-02	11.5%
2010-03	11.2%
2010-04	10.0%
2010-05	9.4%
2010-06	9.4%
2010-07	9.2%
2010-08	9.1%

Unemployment Rates: Females 20 Years & Over

2009-09 8.0%
 2009-10 7.8%
 2009-11 7.6%
 2009-12 7.6%
 2010-01 8.0%
 2010-02 8.0%
 2010-03 7.9%
 2010-04 7.7%
 2010-05 7.8%
 2010-06 8.0%
 2010-07 8.6%
 2010-08 8.6%

Unemployment Rates: Teenagers (16-19)

2009-09 25.8%
 2009-10 25.6%
 2009-11 26.6%
 2009-12 24.8%
 2010-01 26.9%
 2010-02 25.8%
 2010-03 25.3%
 2010-04 23.9%
 2010-05 26.8%
 2010-06 29.0%
 2010-07 26.5%
 2010-08 25.1%

Unemployment Rates: Total U. S.

2009-09 9.5%
 2009-10 9.5%
 2009-11 9.4%
 2009-12 9.7%
 2010-01 10.6%
 2010-02 10.4%
 2010-03 10.2%
 2010-04 9.5%
 2010-05 9.3%
 2010-06 9.6%
 2010-07 9.7%
 2010-08 9.5%

UNEMPLOYMENT RATES BY STATE

August, 2010, Seasonally Adjusted

3.7% North Dakota
 4.5% South Dakota
 4.6% Nebraska
 5.7% New Hampshire
 6.0% Vermont
 6.4% Hawaii
 6.6% Kansas
 6.8% Iowa
 6.8% Wyoming
 7.0% Minnesota
 7.0% Oklahoma
 7.0% Virginia
 7.3% Maryland
 7.4% Montana
 7.4% Utah
 7.5% Arkansas
 7.6% Louisiana
 7.7% Alaska
 7.9% Wisconsin
 8.0% Maine
 8.2% Colorado
 8.3% New Mexico
 8.3% New York
 8.3% Texas
 8.4% Delaware

8.8%	Massachusetts
8.8%	West Virginia
8.9%	Idaho
8.9%	Washington
9.1%	Connecticut
9.2%	Alabama
9.2%	Pennsylvania
9.3%	Missouri
9.6%	New Jersey
9.6%	Tennessee
9.7%	Arizona
9.7%	North Carolina
9.9%	District Of Columbia
10.0%	Georgia
10.0%	Kentucky
10.0%	Mississippi
10.1%	Illinois
10.1%	Ohio
10.2%	Indiana
10.6%	Oregon
11.0%	South Carolina
11.7%	Florida
11.8%	Rhode Island
12.4%	California
13.1%	Michigan
14.4%	Nevada

Commentary 4417

July, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. We are forecasting that US unemployment rates will be roughly 9.86% over the next year. The table shows a HDTFa of 1.80% which suggests that US inflation for the 12 months ending August, 2011 could easily fall between 11.66% and 8.06%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in July, 2010 was 9.70%. That's 0.10% percent higher than the June, 2010 unemployment rate of 9.60%. It is the same as the July, 2009 rate. The rise in unemployment rates from June to July indicates that the short term unemployment rate trend has been up. If that trend continues, we should see an unemployment rate in August, 2010 that is close to 9.80%.

The US unemployment rate one year ago was 9.70%. The average rate over the last year was 9.75%. The average rate over the last 10 years was 5.87%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.69%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in July of 2010 are high relative to the historical 5.69% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX
(Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2009-08 9.4%
 2009-09 9.5%
 2009-10 9.6%
 2009-11 9.7%
 2009-12 10.4%
 2010-01 11.6%
 2010-02 11.5%
 2010-03 11.2%
 2010-04 10.0%
 2010-05 9.4%
 2010-06 9.4%
 2010-07 9.2%

Unemployment Rates: Females 20 Years & Over

2009-08 8.3%
 2009-09 8.0%
 2009-10 7.8%
 2009-11 7.6%
 2009-12 7.6%
 2010-01 8.0%
 2010-02 8.0%
 2010-03 7.9%
 2010-04 7.7%
 2010-05 7.8%
 2010-06 8.0%
 2010-07 8.6%

Unemployment Rates: Teenagers (16-19)

2009-08 24.2%
 2009-09 25.8%
 2009-10 25.6%
 2009-11 26.6%
 2009-12 24.8%
 2010-01 26.9%
 2010-02 25.8%
 2010-03 25.3%
 2010-04 23.9%
 2010-05 26.8%
 2010-06 29.0%
 2010-07 26.5%

Unemployment Rates: Total U. S.

2009-08 9.6%
 2009-09 9.5%
 2009-10 9.5%
 2009-11 9.4%
 2009-12 9.7%
 2010-01 10.6%
 2010-02 10.4%
 2010-03 10.2%
 2010-04 9.5%
 2010-05 9.3%
 2010-06 9.6%
 2010-07 9.7%

UNEMPLOYMENT RATES BY STATE

July, 2010, Seasonally Adjusted

3.6% North Dakota
 4.4% South Dakota
 4.7% Nebraska
 5.8% New Hampshire
 6.0% Vermont
 6.3% Hawaii
 6.5% Kansas
 6.7% Wyoming
 6.8% Iowa
 6.8% Minnesota
 6.9% Oklahoma
 7.0% Virginia

7.1%	Maryland
7.2%	Louisiana
7.2%	Utah
7.3%	Montana
7.4%	Arkansas
7.7%	Alaska
7.8%	Wisconsin
8.0%	Colorado
8.1%	Maine
8.2%	New Mexico
8.2%	New York
8.2%	Texas
8.4%	Delaware
8.6%	West Virginia
8.8%	Idaho
8.9%	Connecticut
8.9%	Washington
9.0%	Massachusetts
9.2%	Missouri
9.3%	Pennsylvania
9.6%	Arizona
9.7%	Alabama
9.7%	New Jersey
9.8%	District Of Columbia
9.8%	North Carolina
9.8%	Tennessee
9.9%	Georgia
9.9%	Kentucky
10.2%	Indiana
10.3%	Illinois
10.3%	Ohio
10.6%	Oregon
10.8%	Mississippi
10.8%	South Carolina
11.5%	Florida
11.9%	Rhode Island
12.3%	California
13.1%	Michigan
14.3%	Nevada

Commentary 3807

June, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. We are forecasting that US unemployment rates will be roughly 10.73% over the next year. The table shows a HDTF of 1.96% which suggests that US inflation for the 12 months ending July, 2011 could easily fall between 12.69% and 8.77%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in June, 2010 was 9.60%. That's 0.30% percent higher than the May, 2010 unemployment rate of 9.30%. It is 0.10% percent lower than the June, 2009 unemployment rate of 9.70%. The rise in unemployment rates from May to June indicates that the short term unemployment rate trend has been up. If that trend continues, we should see an unemployment rate in July, 2010 that is close to 9.90%.

The US unemployment rate one year ago was 9.70%. The average rate over the last year was 9.75%. The average rate over the last 10 years was 5.83%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.69%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in June of 2010 are high relative to the historical 5.69% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX (Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2009-07	9.4%
2009-08	9.4%
2009-09	9.5%
2009-10	9.6%
2009-11	9.7%
2009-12	10.4%
2010-01	11.6%
2010-02	11.5%
2010-03	11.2%
2010-04	10.0%
2010-05	9.4%
2010-06	9.4%

Unemployment Rates: Females 20 Years & Over

2009-07	8.4%
2009-08	8.3%
2009-09	8.0%
2009-10	7.8%
2009-11	7.6%
2009-12	7.6%
2010-01	8.0%
2010-02	8.0%
2010-03	7.9%
2010-04	7.7%
2010-05	7.8%
2010-06	8.0%

Unemployment Rates: Teenagers (16-19)

2009-07	24.8%
2009-08	24.2%
2009-09	25.8%
2009-10	25.6%
2009-11	26.6%
2009-12	24.8%
2010-01	26.9%
2010-02	25.8%
2010-03	25.3%
2010-04	23.9%
2010-05	26.8%
2010-06	29.0%

Unemployment Rates: Total U. S.

2009-07	9.7%
2009-08	9.6%
2009-09	9.5%
2009-10	9.5%
2009-11	9.4%
2009-12	9.7%
2010-01	10.6%
2010-02	10.4%
2010-03	10.2%
2010-04	9.5%
2010-05	9.3%
2010-06	9.6%

UNEMPLOYMENT RATES BY STATE

June, 2010, Seasonally Adjusted

3.6%	North Dakota
4.5%	South Dakota
4.8%	Nebraska
5.9%	New Hampshire
6.0%	Vermont
6.3%	Hawaii
6.5%	Kansas
6.8%	Iowa
6.8%	Minnesota
6.8%	Oklahoma
6.8%	Wyoming
7.0%	Louisiana
7.0%	Virginia
7.1%	Maryland
7.2%	Utah
7.3%	Montana
7.5%	Arkansas
7.9%	Alaska
7.9%	Wisconsin
8.0%	Colorado
8.0%	Maine
8.2%	New Mexico
8.2%	New York
8.2%	Texas
8.5%	Delaware
8.5%	West Virginia
8.8%	Connecticut
8.8%	Idaho
8.9%	Washington
9.0%	Massachusetts
9.1%	Missouri
9.2%	Pennsylvania
9.6%	Arizona
9.6%	New Jersey
10.0%	District Of Columbia
10.0%	Georgia
10.0%	Kentucky
10.0%	North Carolina
10.1%	Indiana
10.1%	Tennessee
10.3%	Alabama
10.4%	Illinois
10.5%	Ohio
10.5%	Oregon
10.7%	South Carolina
11.0%	Mississippi
11.4%	Florida
12.0%	Rhode Island
12.3%	California
13.2%	Michigan
14.2%	Nevada

Commentary 3655

April, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. We are forecasting that US unemployment rates will be roughly 11.50% over the next year. The table shows a HDTF of 2.10% which suggests that US inflation for the 12 months ending May, 2011 could easily fall between 13.60% and 9.40%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in April, 2010 was 9.50%. That's 0.70% percent lower than the March, 2010 unemployment rate of 10.20%. It is 0.90%

percent higher than the April, 2009 unemployment rate of 8.60%. The fall in unemployment rates from March to April indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in May, 2010 that is close to 8.80%.

The US unemployment rate one year ago was 8.60%. The average rate over the last year was 9.74%. The average rate over the last 10 years was 5.74%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.68%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in April of 2010 are high relative to the historical 5.68% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX (Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2009-05	9.5%
2009-06	9.5%
2009-07	9.4%
2009-08	9.4%
2009-09	9.5%
2009-10	9.6%
2009-11	9.7%
2009-12	10.4%
2010-01	11.6%
2010-02	11.5%
2010-03	11.2%
2010-04	10.0%

Unemployment Rates: Females 20 Years & Over

2009-05	7.2%
2009-06	7.9%
2009-07	8.4%
2009-08	8.3%
2009-09	8.0%
2009-10	7.8%
2009-11	7.6%
2009-12	7.6%
2010-01	8.0%
2010-02	8.0%
2010-03	7.9%
2010-04	7.7%

Unemployment Rates: Teenagers (16-19)

2009-05	23.6%
2009-06	27.8%
2009-07	24.8%
2009-08	24.2%
2009-09	25.8%
2009-10	25.6%
2009-11	26.6%
2009-12	24.8%
2010-01	26.9%
2010-02	25.8%
2010-03	25.3%
2010-04	23.9%

Unemployment Rates: Total U. S.

2009-05	9.1%
2009-06	9.7%
2009-07	9.7%
2009-08	9.6%
2009-09	9.5%
2009-10	9.5%
2009-11	9.4%
2009-12	9.7%
2010-01	10.6%
2010-02	10.4%
2010-03	10.2%
2010-04	9.5%

UNEMPLOYMENT RATES BY STATE

April, 2010, Seasonally Adjusted

3.8%	North Dakota
4.7%	South Dakota
5.0%	Nebraska
6.4%	Vermont
6.5%	Kansas
6.6%	Oklahoma
6.7%	Hawaii
6.7%	Louisiana
6.7%	New Hampshire
6.9%	Iowa
7.1%	Montana
7.1%	Wyoming
7.2%	Minnesota
7.2%	Virginia
7.3%	Utah
7.5%	Maryland
7.8%	Arkansas
8.0%	Colorado
8.1%	Maine
8.3%	Texas
8.4%	Alaska
8.4%	New York
8.5%	Wisconsin
8.7%	New Mexico
9.0%	Connecticut
9.0%	Delaware
9.0%	Pennsylvania
9.1%	Idaho
9.2%	Massachusetts
9.2%	Washington
9.2%	West Virginia
9.4%	Missouri
9.5%	Arizona
9.8%	New Jersey
10.0%	Indiana
10.4%	Georgia
10.5%	Tennessee
10.6%	Kentucky
10.6%	Oregon
10.8%	North Carolina
10.9%	Ohio
11.0%	Alabama
11.0%	District Of Columbia
11.2%	Illinois
11.5%	Mississippi
11.6%	South Carolina
12.0%	Florida
12.5%	Rhode Island
12.6%	California
13.7%	Nevada
14.0%	Michigan

Commentary 3045

March, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. We are forecasting that US unemployment rates will be roughly 10.92% over the next year. The table shows a HDTFA of 2.00% which suggests that US inflation for the 12 months ending April, 2011 could easily fall between 12.92% and 8.92%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in March, 2010 was 10.20%. That's 0.20% percent lower than the February, 2010 unemployment rate of 10.40%. It is 1.20% percent higher than the March, 2009 unemployment rate of 9.00%. The fall in unemployment rates from February to March indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in April, 2010 that is close to 10.00%.

The US unemployment rate one year ago was 9.00%. The average rate over the last year was 9.67%. The average rate over the last 10 years was 5.69%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.67%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in March of 2010 are high relative to the historical 5.67% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX (Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2009-04	9.3%
2009-05	9.5%
2009-06	9.5%
2009-07	9.4%
2009-08	9.4%
2009-09	9.5%
2009-10	9.6%
2009-11	9.7%
2009-12	10.4%
2010-01	11.6%
2010-02	11.5%
2010-03	11.2%

Unemployment Rates: Females 20 Years & Over

2009-04	6.7%
2009-05	7.2%
2009-06	7.9%
2009-07	8.4%
2009-08	8.3%
2009-09	8.0%
2009-10	7.8%
2009-11	7.6%
2009-12	7.6%
2010-01	8.0%
2010-02	8.0%
2010-03	7.9%

Unemployment Rates: Teenagers (16-19)

2009-04	20.9%
2009-05	23.6%

2009-06	27.8%
2009-07	24.8%
2009-08	24.2%
2009-09	25.8%
2009-10	25.6%
2009-11	26.6%
2009-12	24.8%
2010-01	26.9%
2010-02	25.8%
2010-03	25.3%

Unemployment Rates: Total U. S.

2009-04	8.6%
2009-05	9.1%
2009-06	9.7%
2009-07	9.7%
2009-08	9.6%
2009-09	9.5%
2009-10	9.5%
2009-11	9.4%
2009-12	9.7%
2010-01	10.6%
2010-02	10.4%
2010-03	10.2%

UNEMPLOYMENT RATES BY STATE

March, 2010, Seasonally Adjusted

4.0%	North Dakota
4.8%	South Dakota
5.0%	Nebraska
6.5%	Kansas
6.5%	Vermont
6.6%	Oklahoma
6.8%	Iowa
6.9%	Hawaii
6.9%	Louisiana
7.0%	New Hampshire
7.1%	Montana
7.2%	Utah
7.3%	Wyoming
7.4%	Minnesota
7.4%	Virginia
7.7%	Maryland
7.8%	Arkansas
7.9%	Colorado
8.2%	Maine
8.2%	Texas
8.6%	Alaska
8.6%	New York
8.8%	New Mexico
8.8%	Wisconsin
9.0%	Pennsylvania
9.2%	Connecticut
9.2%	Delaware
9.3%	Massachusetts
9.4%	Idaho
9.5%	Missouri
9.5%	Washington
9.5%	West Virginia
9.6%	Arizona
9.8%	New Jersey
9.9%	Indiana
10.6%	Georgia
10.6%	Oregon
10.6%	Tennessee
10.7%	Kentucky
11.0%	Alabama
11.0%	Ohio
11.1%	North Carolina
11.5%	Illinois

11.5%	Mississippi
11.6%	District Of Columbia
12.2%	South Carolina
12.3%	Florida
12.6%	California
12.6%	Rhode Island
13.4%	Nevada
14.1%	Michigan

Commentary 2969
February, 2010 Data:

The forecast for the US unemployment rate is in the table at the top of this page. We are forecasting that US unemployment rates will be roughly 11.74% over the next year. The table shows a HDTF of 2.15% which suggests that US inflation for the 12 months ending March, 2011 could easily fall between 13.90% and 9.59%. Links to Forecasts for many other economic indicators may be found on the left side of this page.

The annual US unemployment rate in February, 2010 was 10.40%. That's 0.20% percent lower than the January, 2010 unemployment rate of 10.60%. It is 1.50% percent higher than the February, 2009 unemployment rate of 8.90%. The fall in unemployment rates from January to February indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in March, 2010 that is close to 10.20%.

The US unemployment rate one year ago was 8.90%. The average rate over the last year was 9.57%. The average rate over the last 10 years was 5.64%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.67%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in February of 2010 are high relative to the historical 5.67% average.

This page provides a five year chart and a twelve month forecast for US unemployment rates. For links to more information on US unemployment rates, look at the links under the five year chart (above). One link opens a ten year chart. Another opens a sixty year graph of the US unemployment rate.

UNEMPLOYMENT RATES BY AGE AND SEX (Not Seasonally Adjusted)

Unemployment Rates: Males 20 Years & Over

2009-03	9.9%
2009-04	9.3%
2009-05	9.5%
2009-06	9.5%
2009-07	9.4%
2009-08	9.4%
2009-09	9.5%
2009-10	9.6%
2009-11	9.7%
2009-12	10.4%
2010-01	11.6%
2010-02	11.5%

Unemployment Rates: Females 20 Years & Over

2009-03	6.9%
2009-04	6.7%
2009-05	7.2%
2009-06	7.9%

2009-07 8.4%
 2009-08 8.3%
 2009-09 8.0%
 2009-10 7.8%
 2009-11 7.6%
 2009-12 7.6%
 2010-01 8.0%
 2010-02 8.0%

Unemployment Rates: Teenagers (16-19)

2009-03 21.5%
 2009-04 20.9%
 2009-05 23.6%
 2009-06 27.8%
 2009-07 24.8%
 2009-08 24.2%
 2009-09 25.8%
 2009-10 25.6%
 2009-11 26.6%
 2009-12 24.8%
 2010-01 26.9%
 2010-02 25.8%

Unemployment Rates: Total U. S.

2009-03 9.0%
 2009-04 8.6%
 2009-05 9.1%
 2009-06 9.7%
 2009-07 9.7%
 2009-08 9.6%
 2009-09 9.5%
 2009-10 9.5%
 2009-11 9.4%
 2009-12 9.7%
 2010-01 10.6%
 2010-02 10.4%

UNEMPLOYMENT RATES BY STATE

January, 2010, Seasonally Adjusted

4.2% North Dakota
 4.6% Nebraska
 4.8% South Dakota
 6.4% Kansas
 6.6% Iowa
 6.7% Oklahoma
 6.7% Vermont
 6.8% Montana
 6.8% Utah
 6.9% Hawaii
 6.9% Virginia
 7.0% New Hampshire
 7.3% Minnesota
 7.4% Colorado
 7.4% Louisiana
 7.5% Maryland
 7.6% Arkansas
 7.6% Wyoming
 8.2% Maine
 8.2% Texas
 8.5% Alaska
 8.5% New Mexico
 8.7% Wisconsin
 8.8% New York
 8.8% Pennsylvania
 9.0% Connecticut
 9.0% Delaware
 9.2% Arizona
 9.3% Idaho
 9.3% Washington
 9.3% West Virginia

9.5%	Massachusetts
9.5%	Missouri
9.7%	Indiana
9.9%	New Jersey
10.4%	Georgia
10.7%	Kentucky
10.7%	Oregon
10.7%	Tennessee
10.8%	Ohio
10.9%	Mississippi
11.1%	Alabama
11.1%	North Carolina
11.3%	Illinois
11.9%	Florida
12.0%	District Of Columbia
12.5%	California
12.6%	South Carolina
12.7%	Rhode Island
13.0%	Nevada
14.3%	Michigan

Commentary 2893

January, 2010 Data:

The annual US unemployment rate in January, 2010 was 10.60%. That's 0.90% percent higher than the December, 2009 unemployment rate of 9.70%. It is 2.10% percent higher than the January, 2009 unemployment rate of 8.50%. The rise in unemployment rates from December to January indicates that the short term unemployment rate trend has been up. If that trend continues, we should see an unemployment rate in February, 2010 that is close to 11.50%.

The US unemployment rate one year ago was 8.50%. The average rate over the last year was 9.44%. The average rate over the last 10 years was 5.59%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.66%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in January of 2010 are high relative to the historical 5.66% average.

This page provides a sixty year graph for US unemployment rates. For links to more information on US unemployment rates, look at the links under the sixty year chart (above). One link opens a ten year chart. Another opens a twelve month forecast on the US unemployment rate.

Commentary 2283

December, 2009 Data:

The annual US unemployment rate in December, 2009 was 9.70%. That's 0.30% percent higher than the November, 2009 unemployment rate of 9.40%. It is 2.60% percent higher than the December, 2008 unemployment rate of 7.10%. The rise in unemployment rates from November to December indicates that the short term unemployment rate trend has been up. If that trend continues, we should see an unemployment rate in January, 2010 that is close to 10.00%.

The US unemployment rate one year ago was 7.10%. The average rate over the last year was 9.27%. The average rate over the last 10 years was 5.54%.

Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

ForecastChart.com's historical research covers US unemployment rate data back to January, 1948. The average annual unemployment rate during that period of history was 5.65%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in December of 2009 are high relative to the historical 5.65% average.

This page provides a sixty year graph for US unemployment rates. For links to more information on US unemployment rates, look at the links under the sixty year chart (above). One link opens a ten year chart. Another opens a twelve month forecast on the US unemployment rate.

Commentary 2207
November, 2009 Data:

The annual US unemployment rate in November, 2009 was 9.40%. That's 0.10% percent lower than the October, 2009 unemployment rate of 9.50%. It is 2.90% percent higher than the November, 2008 unemployment rate of 6.50%. The fall in unemployment rates from October to November indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in December, 2009 that is close to 9.30%.

The US unemployment rate one year ago was 6.50%. The average rate over the last year was 9.05%. The average rate over the last 10 years was 5.49%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

Our historical research covers US unemployment rate data back to January, 1922. The average annual unemployment rate during that period of history was 5.65%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in November of 2009 are high relative to the historical 5.65% average.

This page provides a sixty year graph for US unemployment rates. For links to more information on US unemployment rates, look at the links under the sixty year chart (above). One link opens a ten year chart. Another opens a twelve month forecast on the US unemployment rate.

Commentary 2131
October, 2009 Data:

The annual US unemployment rate in October, 2009 was 9.50%. That's the same as the September, 2009 rate, It is 3.40% percent higher than the October, 2008 unemployment rate of 6.10%. The sideways movement in unemployment rates from September to October indicates that the short term employment trend has been flat. If that trend continues, we should see an unemployment rate in November, 2009 that is close to 9.50%.

The US unemployment rate one year ago was 6.10%. The average rate over the last year was 8.81%. The average rate over the last 10 years was 5.44%.

Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

Our historical research covers US unemployment rate data back to January, 1922. The average annual unemployment rate during that period of history was 5.64%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in October of 2009 are high relative to the historical 5.64% average.

This page provides a sixty year graph for US unemployment rates. For links to more information on US unemployment rates, look at the links under the sixty year chart (above). One link opens a ten year chart. Another opens a twelve month forecast on the US unemployment rate.

Commentary 1140
September, 2009 Data:

The annual US unemployment rate in September, 2009 was 9.50%. That's 0.10% percent lower than the August, 2009 unemployment rate of 9.60%. It is 3.50% percent higher than the September, 2008 unemployment rate of 6.00%. The fall in unemployment rates from August to September indicates that the short term unemployment rate trend has been down. If that trend continues, we should see an unemployment rate in October, 2009 that is close to 9.40%.

The US unemployment rate one year ago was 6.00%. The average rate over the last year was 8.53%. The average rate over the last 10 years was 5.39%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

Our historical research covers US unemployment rate data back to January, 1922. The average annual unemployment rate during that period of history was 5.64%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in September of 2009 are high relative to the historical 5.64% average.

This page provides a sixty year graph for US unemployment rates. For links to more information on US unemployment rates, look at the links under the sixty year chart (above). One link opens a ten year chart. Another opens a twelve month forecast on the US unemployment rate.

Commentary 1064
August, 2009 Data:

The annual US unemployment rate in August, 2009 was 9.60%. That's 0.10% percent lower than the July, 2009 unemployment rate of 9.70%. It is 3.50% percent higher than the August, 2008 unemployment rate of 6.10%. The fall in unemployment rates from July to August indicates that the short term unemployment rate trend has been down. If that trend continues, we should see

an unemployment rate in September, 2009 that is close to 9.50%.

The US unemployment rate one year ago was 6.10%. The average rate over the last year was 8.23%. The average rate over the last 10 years was 5.35%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

Our historical research covers US unemployment rate data back to January, 1922. The average annual unemployment rate during that period of history was 5.63%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in August of 2009 are high relative to the historical 5.63% average.

This page provides a sixty year graph for US unemployment rates. For links to more information on US unemployment rates, look at the links under the sixty year chart (above). One link opens a ten year chart. Another opens a twelve month forecast on the US unemployment rate.

Commentary 988
July, 2009 Data:

The annual US unemployment rate in July, 2009 was 9.70%. That's the same as the June, 2009 rate. It is 3.70% percent higher than the July, 2008 unemployment rate of 6.00%. The sideways movement in unemployment rates from June to July indicates that the short term employment trend has been flat. If that trend continues, we should see an unemployment rate in August, 2009 that is close to 9.70%.

The US unemployment rate one year ago was 6.00%. The average rate over the last year was 7.94%. The average rate over the last 10 years was 5.30%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

Our historical research covers US unemployment rate data back to January, 1922. The average annual unemployment rate during that period of history was 5.63%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in July of 2009 are high relative to the historical 5.63% average.

This page provides a sixty year graph for US unemployment rates. For links to more information on US unemployment rates, look at the links under the sixty year chart (above). One link opens a ten year chart. Another opens a twelve month forecast on the US unemployment rate.

June, 2009 Data:

The annual US unemployment rate in June, 2009 was 9.70%. That's 0.60% percent higher than the May, 2009 unemployment rate of 9.10%. It is 4.00% percent higher than the June, 2008 unemployment rate of 5.70%. The rise in unemployment rates from May to June provides evidence that the short term

unemployment rate trend is up. If that trend continues, we should see an unemployment rate in July, 2009 that is close to 10.30%.

The US unemployment rate one year ago was 5.70%. The average rate over the last year was 7.63%. The average rate over the last 10 years was 5.26%. Higher rates over the last 12 months compared to the average rates over the last 10 years serve as an indicator that the long term trend in the US unemployment rate is up. Unemployment rate expectations should be adjusted accordingly.

Our historical research covers US unemployment rate data back to January, 1922. The average annual unemployment rate during that period of history was 5.62%. The highest rate was 10.80%. The lowest rate was 2.50%. The high was attained in November of 1982. The low was achieved in May of 1953. Recent rates experienced in June of 2009 are high relative to the historical 5.62% average.

This page provides a sixty year graph for US unemployment rates. For links to more information on US unemployment rates, look at the links under the sixty year chart (above). One link opens a ten year chart. Another opens a twelve month forecast on the US unemployment rate.

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COMMUNITY COLLEGE DISTRICT

Education Master Plan
Information Submission Form

The GCCCD is starting a year-long process to develop an Educational Master Plan that will serve as the blueprint for our future. The Educational Master Plan is a long-range, comprehensive document intended to guide institutional and program development at both the college and district levels. The priorities established in the Educational Master Plan will serve to guide College and District decisions about growth, development and resource allocation.

As the first step in this planning process, everyone in the GCCCD community (faculty, staff, students and community members) are invited to identify and submit information sources to be reviewed for the trend analysis in one of six taxonomy areas - society, technology, economy, environment, politics, and education. We are not asking you to do new research - only to identify information you already have or that you encounter during the search period (March 21 - April 25) and bring it to the attention of the Scan Teams for review.

Please feel free to submit as many of these forms as you would like. Please answer the following questions for each submission:

1) What is the document we should review? :

2) Author:

3) Source:

4) Which of the following taxonomy areas does it fit into? (Please select only one):

- Society
- Technology
- Economy
- Environment
- Politics and Legal Issues
- Education

Other:

5) Relevance:

6) Page / Section:

7) Add Attachment/Hyperlink Here:

To attach a document: **Reader 9:Tools-Comments and Markups-Attach A File As A Comment**
Reader X: Comment (upper right), select paper clip icon under Annotations

Questions: lynne.davidson@gcccd.edu *Research, Planning and Institutional Effectiveness*



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UNDERSTANDING THE GREEN ECONOMY IN CALIFORNIA

A Community College Perspective

JUNE 2009



**CENTERS OF
EXCELLENCE**

**Economic & Workforce
Development Program**

**California Community
Colleges**

www.coeccc.net/green

An Initiative of



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South Central COE

Hosted by
Ventura College Institute for Community &
Professional Development
71 Day Road, Ventura, CA 93003
Phone: (805) 648-8987
Email: sdwyer@vcccd.edu

Inland Empire/Desert COE

Hosted by
San Bernardino CCD
114 S. Del Rosa, San Bernardino, CA 92408
Phone: (909) 382-4037
Email: kfleming@sbccd.edu

LA County COE

Hosted by
Los Angeles CCD
770 Wilshire Boulevard, Los Angeles, CA 90017
Phone: (213) 891-2162
Email: lewenble@laccd.edu

San Diego/Imperial COE

Hosted by
Cuyamaca College
900 Rancho San Diego Parkway
El Cajon, CA 92019
Phone: (619) 660-5529
Email: philip.jordan@gcccd.edu

Northern California COE

Hosted by
Los Rios CCD
1410 Ethan Way, Sacramento, CA 95825
Phone: (916) 563-3221
Email: milant@losrios.edu

Central Valley COE

Hosted by
Modesto Junior College
435 College Avenue, Modesto, CA 95350
Phone: (209) 575-6908
Email: marquezm@mjc.edu



Mission: The Centers of Excellence, in partnership with business and industry, deliver regional workforce research customized for community college decision making and resource development.

Vision: We aspire to be the premier source of regional economic and workforce information and insight for community colleges.

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Centers of Excellence, Economic and Workforce Development Program

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And lastly, sincere appreciation to all contributing Center of Excellence Directors who have worked diligently to produce this overview of the green economy.

The Obama Administration estimates that the \$787 billion American Recovery and Investment Act will create over 400,000 jobs in California, thousands of which will be in the green sectors.¹

Executive Summary

There is perhaps no area creating more interest from economists, legislators, or the general public than “The Green Economy.” This intrigue has created a flurry of reports to address potential impacts to jobs and the economy, as well as strong public investments from local, state, and federal governments. California's community colleges will play a critical role in training a green-collar workforce, and will therefore require a comprehensive understanding of the needs of industry to appropriately meet this challenge.

For all of the interest generated by the green economy, there are equal parts of confusion, skepticism, and misunderstanding. Much of this can be attributed to a lack of consistency in defining green jobs and firms and an inconsistent understanding of the practical implications of the greening of the economy. The Centers of Excellence initiated a study of the green economy in the fall of 2008. The intent of the study was to create a better understanding of the green economy for California community colleges and their workforce development partners. This report will:

- Provide definitions for green jobs and green firms to allow for consistent use and understanding;
- Illustrate the various scenarios for how green is affecting the workforce;
- Demonstrate the green subsectors, traditional occupations and sectors, and emerging occupations and sectors; and
- Provide a framework for additional study to help colleges respond to this new green reality.

This is a statewide report produced collaboratively by multiple regional Centers of Excellence. It is the culmination of months of research, development and validation by industry professionals and subject matter experts. Given the complex nature of the green economy and its continuing evolution, this framework should be considered a “living document” as it will undergo future revisions as more becomes known about the direction of the various green industry sectors and occupations.

Introduction

Understanding the green economy and the opportunities it provides for preparing the workforce that would meet its demands has been of critical importance to California Community Colleges for some time. Increasing energy and commodity costs, legislative requirements, and consumer demands for a more sustainable environment have all led to a substantial push for a green economy in industries such as energy and utilities, construction, transportation, and manufacturing.

¹ Online source: www.recovery.gov

A number of developments in public and private investments and regulations have contributed to this green movement. California's Air Resources Board projects that, as a result of the passage of AB 32 (the state's global warming solutions law) 100,000 new jobs will be created.² The Obama Administration estimates that the \$787 billion American Recovery and Reinvestment Act will create over 400,000 jobs in California, thousands of which will be in green sectors.³ Billions of dollars have been allocated for education and training programs, with over \$500 million earmarked in the Department of Labor alone for training workers for the green economy.⁴ Additional monies are being made available through other local, state and federal agencies.

With these recent economic and legislative developments both on federal and state levels, preparing a workforce for the green economy has become a top priority. Community colleges' faculty and administrators are trying to rapidly adapt program and training offerings to align with industries of the green economy in their respective communities. However, the ambiguity around the definitions and classifications of the green job markets and how they relate to the college programs makes this task rather challenging when beginning or updating programs.

To mitigate some of the confusion about the green economy workforce and to support colleges in their pursuit of green educational programs, the Centers of Excellence (COE) have begun the process of determining what relationships exist between emerging green industry sectors, existing traditional industry sectors, jobs within each of those sectors, and existing college programs that could be adapted to address the training needs for such jobs. COE efforts have resulted in this report which outlines such relationships in the form of a crosswalk to guide the community colleges in bringing "green" components into existing training programs, beginning new programs, and in seeking additional resources through the American Reinvestment and Recovery Act, better known as "stimulus funding." Given the continuing evolution of the green economy, this framework should be considered a "living document" as it will undergo future revisions as more becomes known about the direction of the various green industry sectors and occupations.

Research Methodology

Purpose and Objectives

The overall purpose of the information presented in this report is to identify, from the California Community College perspective, opportunities for training in green industries using existing industries and occupations as the base. Specifically, this research attempts to:

- Create operational definitions of green firms and green jobs that are relevant to community colleges;
- Classify the green economy into major sectors or areas and develop an outline of green emerging industries and subsectors included in each sector;
- Develop a crosswalk between green industry sectors and green occupations that require specialized training, but currently are not classified under the Standard Occupational Classification (SOC) system;

² California Environmental Protection Agency Air Resources Board: <http://www.arb.ca.gov/newsrel/nr091708.htm>

³ Online source: <http://www.recovery.gov/?q=contentt/impact>

⁴ American Reinvestment and Recovery Act Title VIII(6)

- Outline a list of occupations that currently have an SOC code and could be re-trained for the emerging green jobs within each industry sector; and
- Develop a crosswalk between the specified occupations with SOC codes and community college programs that currently train for those occupations as defined by the California Community College Taxonomy of Occupational Programs (TOP) system.

There is a recognizable need to estimate the number of jobs across the green industries and sectors for most of the identified occupations in this crosswalk, as well as a need to create comprehensive profiles of the occupations that are gaining momentum. The COE initiative will use this green economy framework to begin focused industry and/or occupational studies within the six subsectors identified in the industry crosswalk.

A number of focused industry reports have already been completed by the COE initiative, including solar energy, energy efficiency, green construction, and water technology. These may be accessed and downloaded at www.coeccc.net.

In May 2009, the Employment Development Department, Labor Market Information Division (EDD-LMID) launched a survey of over 51,000 California employers.⁵ The Centers of Excellence assisted EDD-LMID in the development and design of the survey. The purpose of the survey, in part, is to estimate the number of green jobs in California and identify emerging green occupations. Efforts are underway by EDD-LMID to gather and report this green labor market information. For more information about the survey, please visit the EDD-LMID website at www.labormarketinfo.edd.ca.gov.

Approach

During the fall of 2008, the Centers of Excellence collected, screened and analyzed existing information on the green economy, green jobs and educational programs. A variety of existing research on the green economy was used to form the basis of the green economy framework presented in this report. Of particular interest to the Centers of Excellence in reviewing existing work was the identification of green industry sectors, related occupations, methodology to identify and/or possibly connect the two, and finally, the applicability for community college program modification and/or development. Many of these studies were found through the Employment Development Department, Labor Market Information Division's Green Digest.⁶ Please see the References section for a complete listing of these reports.

The compilation of the crosswalk between green industries, occupations and college programs resulted in a four-phase methodological process. The crosswalk became the green economy framework; the methodological process is described below and presented in Figure 1.

1. Working definitions of a green firm and a green job were developed.
2. Referencing the green firm and green jobs definitions, a set of criteria for inclusion into the crosswalk was developed. The criteria include the following:
 - Green clusters, sectors, and occupations align with the definitions identified in this report.
 - Occupations included require new or additional training in green technology.

⁵ EDD-LMID Green Digest, <http://www.labormarketinfo.edd.ca.gov/?pageid=1032>

⁶ Ibid.

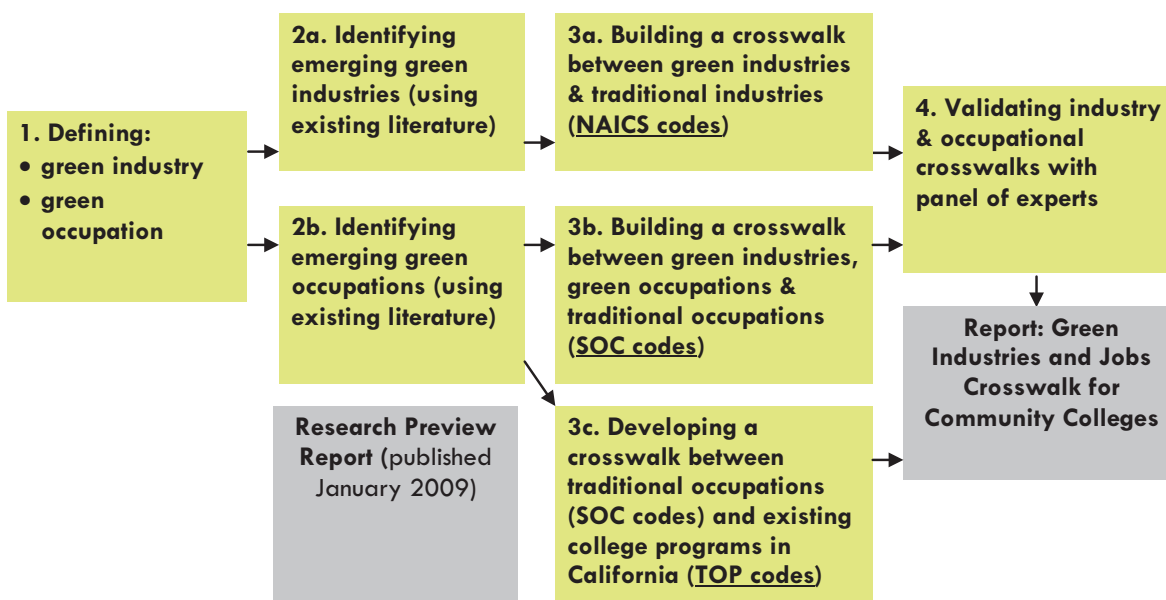
- Occupations included may experience growth in the emerging green economy.
- Occupations directly contribute to minimizing environmental impact, and do not function in a tertiary capacity within a “green firm.”
- Training needs can be reasonably addressed by California Community Colleges and/or offer career pathway options.

3. After establishing green definitions and criteria for inclusion, industries, subsectors, and occupations were determined and grouped. COEs relied on existing classification systems to establish the links between the emerging green subsectors and traditional and emerging jobs. Jobs were identified within the six industry sectors. Thus, three key points of reference were developed. They include the following:

- Green industries were cross referenced to traditional North American Industry Classification System (NAICS) industries;
- Green emerging occupations and traditional occupations were cross referenced to Standard Occupational Codes (SOC); and
- SOC occupations were cross referenced to educational course offerings. For California, this was to California Community College programs (using Taxonomy of Program or TOP codes) that are currently approved. For national application, the corresponding Classification of Instructional Programs (CIP) codes are also referenced in an expanded spreadsheet available at the Center of Excellence website (www.coecc.net/green).

4. After the identified green sectors and occupations were placed into the crosswalk, the information was validated by a panel of state and national industry and subject matter experts. Please see Appendix C for a list of individuals and organizations who provided input.

Figure 1 - Process of Building the Crosswalk



Operational Definitions

There are no commonly accepted definitions for what constitutes a green job or a green business, which may be due to the different purposes, contexts, and usages of these definitions. The COE's purpose was to look at emerging, changing, and rapidly growing industries, as well as occupations that are completely new (emerging) and/or require new knowledge, skills and abilities (KSAs). Keeping this in mind, the following definitions were developed.

A **Green Firm** is an organization that provides products and/or services that are aimed at utilizing resources more efficiently, providing renewable sources of energy, lowering greenhouse gas emissions, or otherwise minimizing environmental impact.

Green firms with similar activities, production value chains and/ or products can form a green industry, sub-sector or sector. In particular, the COEs have classified all green firms into six green sectors or areas:

- Renewable Energy: Energy Generation, System Installation & Storage
- Green Building and Energy Efficiency
- Biofuels Production & Farming
- Transportation & Alternative Fuels
- Water, Wastewater & Waste Management
- Environmental Compliance & Sustainability Planning

Equally important to understanding the green economy is a common understanding of a green job. For purposes of this report, the following operational definition of a green job was developed.

A **Green Job** is an occupation that 1) directly works with policies, information, materials, and/or technologies that contribute to minimizing environmental impact, and 2) requires specialized knowledge, skills, training, or experience in these areas.

For an occupation to be included in this community college perspective, it must satisfy both criteria. As defined, green jobs play out in a variety of ways in the workplace, but generally fall into one of three scenarios, which have different impacts on community college program development.

Scenario 1: Additional critical green skills necessary for continued employment within a traditional occupation. In this scenario, new green skills have become a requirement for employment. For example, the job market in San Diego required that landscapers have water management skills and knowledge and understanding of drought resistant plants due to new mandatory water restrictions on homeowners and businesses. In this scenario, the job title (landscaper) has not changed, but critical skill augmentation has become necessary for employment. For community colleges, existing curriculum for these programs may need revision to incorporate this new skill training.

Scenario 2: Additional – but not critical – green skills make traditional workers more employable. In this scenario, new green skills are not requirements of employment but make workers more marketable in the workforce. For example, the job market does not require that plumbers have skills and experience installing solar thermal water systems, but the skill augmentation makes any plumber

with that skill set more employable and competitive. In this scenario, the job title has not changed, but the individual holding the title has a skill upgrade. For community colleges, this scenario may warrant offering fee-based training courses to incumbent workers to green their existing skill set and/or the repackaging of existing courses into new certificates with relatable green skills.

Scenario 3: Additional related or unrelated green skills allow for transition to new job with new title. In this scenario, new green skills have led to a completely new occupation. For example, a welder can be trained on geothermal operations and become a geothermal technician. In this scenario, entirely new certificate and/or degree programs need to be developed at the community colleges to address new and emerging occupations.

The first two “green job” scenarios target traditional occupations with existing Standard Occupational Classification (SOC), while the third scenario deals with emerging green occupations. For colleges, the first two scenarios require an analysis of existing education and training programs geared toward traditional occupations experiencing the most impact from the green economy. This can be accomplished most easily by reviewing, modifying, and repackaging current offerings.

O*NET, the online occupational network, recently issued a publication to study the impact of green activities and technologies on occupational requirements relative to current SOC occupations and new and emerging occupations.⁷ In its publication, O*NET classifies all green occupations into three categories: green increased demand occupations, green enhanced skills occupations, and green new and emerging occupations. This approach aligns well with the conceptual framework of this report, as the COE distinguishes and lists both the enhanced skills occupations and emerging ones in the developed crosswalks. The COE also recognizes that some jobs will be growing due to the developments in green economy, without any changes in skill sets of traditional occupations. According to O*NET, these are green increased demand occupations. Although they were not the focus of this research, some of these growing occupations were included in the occupational crosswalk.

Green Occupations: O*NET Approach

“The ‘greening’ of occupations refers to the extent to which green economy activities and technologies increase the demand for existing occupations, shape the work and worker requirements needed for occupational performance, or generate unique work and worker requirements.”

Based on this definition of “greening” occupations, O*NET developed three general categories within which to classify green jobs:

Green Increased Demand Occupations – increase in demand for an existing occupation; does not entail significant changes in the work and worker requirements; work context may change, tasks themselves do not.

Green Enhanced Skills Occupations – significant change to the work and worker requirements of an existing O*NET-SOC occupation; may or may not result in increased demand; essential purpose remains the same, but tasks, skills, knowledge and possibly credential requirements have been altered.

Green New and Emerging (N&E) Occupations – need for unique work and worker requirements, results in generation of a new occupation.⁸

⁷ The National Center for O*NET Development, *Greening of the World of Work: Implications for O*NET-SOC and New and Emerging Occupations*, February 2009 (www.onetcenter.org/reports/Green.html)

⁸ *Ibid.*

Green Industry Framework

Under the guidance of the green working definitions, the six major sectors/areas of the green economy (referenced above) were identified. Each of the sectors represents a value chain of activities (Research & Development, Manufacturing, Distribution, Installation, Maintenance & Repair), which are clustered around a similar “green” technology and/or purpose. This approach set the parameters for selecting the industry clusters within a “green” technology value chain, and thus looks at a full range of potential employment opportunities. These six major sectors and clusters are presented in the following table.

California's Green Economy - Industry Overview		
Green Economy area/sector	Industry Sector (2-digit NAICS)	NAICS Description [notes]
Renewable Energy: Energy Generation, System Installation & Storage	Utilities (22)	221111 Hydroelectric Power Generation
		221119 Other Electric Power Generation
		221121 Electric Bulk Power Transmission and Control
		221122 Electric Power Distribution
		221330 Steam and Air-Conditioning Supply
	Construction (23)	237130 Power and Communication Line and Related Structures Construction
		238160 Roofing Contractors
		238210 Electrical Contractors and Other Wiring Installation Contractors
	Manufacturing (31-33)	238220 Plumbing, Heating, and Air-Conditioning Contractors
		325000 Chemical Manufacturing
333295 Semiconductor Machinery Manufacturing [Machines to manufacture solar panels.]		
333611 Turbine and Turbine Generator Set Units		
334413 Semiconductor and Related Device Manufacturing [Solar panel and fuel cell manufacturing.]		
Wholesalers (42) Professional, Scientific, & Technical Services (54)	334512 Automatic Environmental Control Manufacturing	
	335911 Storage Battery Manufacturing	
	423720 Plumbing & Heating Equipment & Supplies (Hydronics) Merchant Wholesalers [Solar panel sales.]	
	541330 Engineering Services	
	541370 Survey and Mapping Services	
	541380 Testing Laboratories	
	541620 Environmental Consulting Services	
	541690 Other Scientific and Technical Consulting Services	
	Other Services (81)	541712 Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)
		811219 Other Electronic and Precision Equipment Repair and Maintenance
811310 Commercial and Industrial Machinery (except automotive and electronic) Repair and Maintenance		

California's Green Economy - Industry Overview		
Green Economy area/sector	Industry Sector (2-digit NAICS)	NAICS Description [notes]
Green Building and Energy Efficiency	Utilities (22)	221100 Electric Power Generation, Transmission & Distribution [Energy conservation planning & consulting.]
	Construction (23)	221200 Natural Gas Distribution
		236000 Construction of Buildings
		236115 New Single-Family Housing Construction (except Operative Builders)
		236116 New Multifamily Housing Construction (except Operative Builders)
		236117 New Housing Operative Builders
		236118 Residential Remodelers
		236210 Industrial Building Construction
		236220 Commercial and Institutional Building Construction
		238000 Specialty Trade Contractors (incl. Electrical Contractors)
		238210 Electrical Contractors and Other Wiring Installation Contractors
		238220 Plumbing, Heating and Air-Conditioning Contractors
		238350 Finish Carpentry Contractors
		238990 All Other Specialty Trade Contractors
		238990 Roofing Contractors
		333400 Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing
		333414 Heating Equipment (except Warm Air Furnaces) Manufacturing
		335110 Electric Lamp Bulb/Parts Mnf
	335121 Residential Electric Lighting Fixture Mnf	
	335122 Commercial, Industrial, Institutional Lighting Fixture Mnf	
	335129 Other Lighting Equipment Mnf	
	335311 Power, Distribution, and Specialty Transformer Manufacturing	
	423720 Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers	
531311 Residential Property Managers		
531312 Nonresidential Property Managers		
541310 Architectural Services		
541320 Landscape Architectural Services		
541330 Engineering Services		
541340 Drafting Services		
541350 Building Inspection Services		
541420 Industrial Design Services		
541620 Environmental Consulting Services		
921000 Cities and Counties		
924000 Administration of Environmental Programs		
Wholesalers (42)		
Real Estate and Rental & Leasing (53)		
Professional, Scientific, & Technical Services (54)		
Public Administration (92)		

California's Green Economy - Industry Overview		
Green Economy area/sector	Industry Sector (2-digit NAICS)	NAICS Description [notes]
Biofuels/Farming	Agriculture, forestry, fishing and hunting (11)	111998 All Other Miscellaneous Crop Farming
		112519 Other Aquaculture
	Manufacturing (31-33)	113110 Timber Tract Operations
		113210 Forest Nurseries and Gathering of Forest Products
		115110 Support Activities for Crop Production
		115310 Support Activities for Forestry
		311223 Other Oilseed Processing
		311225 Fats and Oils Refining and Blending
	Professional, Scientific, & Technical Services (54)	311613 Rendering and Meat Byproduct Processing
		325221 Cellulosic Organic Fiber Manufacturing
		325300 Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing
		333298 All Other Industrial Machinery Manufacturing
Public Administration (92)	541330 Engineering Services	
	541380 Testing Laboratories	
		541620 Environmental Consulting Services
		541690 Other Scientific and Technical Consulting Services
		541711 Research and Development in Biotechnology
		924120 Administration of Conservation Programs

California's Green Economy - Industry Overview

Green Economy area/sector	Industry Sector (2-digit NAICS)	NAICS	Description [notes]
Transportation/ Alternative Fuel	Utilities (22)	221122	Electric Power Distribution
		221210	Natural Gas Distribution
	Manufacturing (31-33)	334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use
		335312	Motor and Generator Manufacturing
		336000	Transportation Equipment Manufacturing
	Retail (44)	441100	Automobile dealers [Service departments.]
		447190	Other Gasoline Stations ¹
	Transportation & warehousing (48-49)	484100	General Freight Trucking
		484200	Specialized Freight Trucking
		485100	Urban Transit Systems [Includes commuter rail systems.]
		485200	Interurban and Rural Bus Transportation
		488310	Port and Harbor Operations
	Professional, Scientific, & Technical Services (54)	541330	Engineering Services
		541370	Survey and Mapping Services
		541380	Testing Laboratories
		541614	Process, Physical Distribution, and Logistics Consulting Services [Relates to logistics.]
		541620	Environmental Consulting Services
		541690	Other Scientific and Technical Consulting Services
	Other Services (81)	811110	Automotive Mechanical and Electrical Repair and Maintenance
		811190	Other Automotive Repair and Maintenance
	Public Administration (92)	925120	Administration of Urban Planning and Community and Rural Development

California's Green Economy - Industry Overview

Green Economy area/sector	Industry Sector (2-digit NAICS)	NAICS	Description [notes]
Water, Wastewater & Waste Management	Utilities (22)	221310	Water Supply and Irrigation Systems
		221320	Sewage Treatment Facilities
	Construction (23)	237110	Water and Sewer Line and Related Structures Construction
		237990	Other Heavy and Civil Engineering Construction [Relates to channel construction.]
	Manufacturing (31 -33)	333312	Commercial Laundry, Drycleaning, and Pressing Machine Manufacturing
		334512	Automatic Environmental Control Mfg. for Residential, Commercial, & Appliance Use
		335222	Household Refrigerator and Home Freezer Manufacturing
	Professional, Scientific, & Technical Services (54)	541330	Engineering Services
		541380	Testing Laboratories
		541620	Environmental Consulting Services
	Administrative & waste services (56)	541690	Other Scientific and Technical Consulting Services
		562111	Solid Waste Collection
		562112	Hazardous Waste Collection
		562119	Other Waste Collection
		562211	Hazardous Waste Treatment and Disposal
		562212	Solid Waste Landfill
562219		Other Nonhazardous Waste Treatment and Disposal	
Public Administration (92)	562910	Remediation Services	
	562920	Materials Recovery Facilities	
	562998	All Other Miscellaneous Waste Management Services	
	924110	Administration of Air and Water Resource and Solid Waste Management Programs	

California's Green Economy - Industry Overview

Green Economy area/sector	Industry Sector (2-digit NAICS)	NAICS	Description [notes]
Environmental Compliance and Sustainability Planning	Professional, Scientific, & Technical Services (54)	541370	Survey and Mapping Services
		541380	Testing Laboratories
		541620	Environmental Consulting Services
	Other Services (81)	541690	Other Scientific and Technical Consulting Services
		813312	Environment, Conservation and Wildlife Organizations
	Public Administration (92)	924110	Administration of Air and Water Resource and Solid Waste Management Programs
		924120	Administration of Conservation Programs
		925120	Administration of Urban Planning and Community and Rural Development
		926120	Regulation and Administration of Transportation Programs
		926130	Regulation and Administration of Communications, Electric, Gas, and Other Utilities

The following section defines each green sector, including the core characteristics and key industry clusters.

Renewable Energy: Energy Generation, System Installation & Storage includes activities that are aimed at developing, introducing and installing the technologies, which harness, generate, store, and distribute renewable sources of energy. Some of these industries have been established for decades, while others represent a new approach to renewable energy generation, installation and storage.⁹ The nine renewable energy industry clusters include:

- **Solar thermal & photovoltaic (PV) systems** is one of the larger renewable energy clusters. Public policy such as AB 118 and AB 32 are drivers in the industry. Although the market has currently slowed, the industry is expected to be one of the most rapidly growing industries in California and in the nation over the next decade. This industry cluster includes firms that are engaged in the development, manufacturing, installation, and servicing of solar energy technology.
- **Wind energy power** is also a rapidly significant contributor to the renewable energy cluster. Since 2000, cumulative wind power capacity has grown an average of 27% per year in the United States. Of the 50 states, California is third only to Texas and Iowa in wind turbine capacity.¹⁰ California's wind capacity is estimated to increase when future energy transmission systems upgrades are complete. The wind energy cluster is primarily comprised of manufacturers of wind turbines, wind farms, and maintenance and operations firms.
- **Hydroelectric power** is a process that has been used for decades. With traditional hydroelectric power, energy is generated by releasing dammed water, which is driven through a turbine and generator. This process is disruptive to the ecosystem, preventing spawning fish access to the river, disrupting the downstream water environment, and producing methane and other greenhouse gases. However, the next generation of hydroelectric power takes steps to reduce environmental impact by eliminating the damming of water as its core process.
- **Geothermal power** plants produce about 4.5 percent of the state's total electricity.¹¹ In California, geothermal power plants are located in areas with volcanic and seismic activity that produce heat at temperatures of 300 degrees Fahrenheit or greater. There are 14 known geothermal areas in California. In addition, nearly 80 percent of California's counties have lower levels of geothermal activity that can be used for direct use projects.¹² Geothermal power plants and companies that are developing and manufacturing geothermal power systems are the primary contributors of jobs in this industry.
- **Smart grid technology** represents an emerging energy delivery system that will change the way energy is delivered, stored, and utilized. In the last year, there have been several breakthroughs with smart grid technology, such as advanced metering, intelligent transmission and distribution automation devices, substation energy storage, and micro-grids. As the technology advances and smart grid projects are deployed widely, it will greatly improve the utilization of energy as well as provide the infrastructure necessary to optimize renewable energy sources.

⁹ Nuclear power is not included in the renewable energy sector due to unresolved challenges related to the storage and disposal of nuclear waste. Nuclear waste remains highly radioactive for thousands of years and must be stored underground in shielded water basins.

¹⁰ Online source: <http://www.windindustry.com/news/wind-energy-growth-in-2008>

¹¹ The U.S. Smart Grid Revolution, KEMA'S Perspective for Job Creation

¹² California Energy Commission, <http://www.energy.ca.gov/geothermal>

- **Hydrogen** is mostly used for generating electricity. It involves a process of joining hydrogen with oxygen to make water, while generating electricity on demand. Hydrogen can be stored in a cell and when activated it passes through a specialized membrane to create electricity, replacing traditional batteries. At this state of hydrogen technology development, the industry predominantly includes research and development firms and some small manufacturers.¹³
- **Energy storage** is one of the key issues facing the renewable energy sector. While there are a few techniques available to store electricity, most renewable energy is utilized at the time of production. Although expensive, one storage technique uses electrical energy to pump water uphill to store until needed. At that point, energy is generated by moving water downhill through a turbine. Fuel cells are another energy storage process. Battery manufacturers and installers as well as fuel cell development and testing laboratories comprise the energy storage cluster.
- **Energy transmission/distribution** is the process that connects renewable energy sources to utilities and consumers. Utilities and energy transmission contractors are the key player in the energy distribution market.
- **Energy services (ESCO)** companies manage full scale projects aimed at improving energy efficiency and ongoing maintenance costs for facilities over a seven to twenty year time period. Most ESCO companies manage the project from start to finish, including equipment installation, securing financing, and monitoring the project's energy savings.¹⁴

Green Building and Energy Efficiency is a category comprised of industries that are clustered around the purpose of making new and existing buildings resource efficient and friendly to the environment. Energy Efficiency, as well as being part of Green Building, also includes private and public agencies responsible for energy planning and management. Thirty nine (39) percent of the total U.S. energy use can be contributed to the construction and operation of residential and commercial buildings.¹⁵ Because buildings are such a significant consumer of energy and contributor to greenhouse gas emissions, they also need to be a focal point for any potential solutions. Further, current state legislation (e.g. AB 32, the state's global warming solutions law) requires that buildings become more energy efficient, which is also creating demand for green product manufacturing. The eight green building and energy efficiency industry clusters include:

- **Green product manufacturing** is considered to have the largest share of employment in the green economy by some researchers. There is a variety of manufacturing sub-sectors that support the green building and energy efficiency sector, including lighting, construction materials, "Smart" systems, water systems, and HVAC/R equipment.
- **Green construction** materials wholesaling supplies green products and materials to builders and energy service organizations.
- **Design and construction of new buildings** contractors produce less waste during the construction cycle and the buildings they design and construct utilize less energy to operate. Although it may be more expensive to build an energy efficient structure, the cost and subsequent savings are achieved over a short period of time. Most contractors

¹³ California Fuel Cell Partnership, <http://www.fuelcellpartnership.org>

¹⁴ National Association of Energy Service Companies, <http://www.naesco.org/>

¹⁵ Energy Information Administration, www.eia.doe.gov, 2008

rely on certification specifications and guidelines, such as the Leadership in Energy and Environmental Design (LEED) and the Green Point Rating System.

- **Retrofitting & retro-commissioning of existing structures** represent a significant opportunity to reduce energy usage across the state. One of the primary objectives of the American Recovery and Reinvestment Act is to invest in retrofitting public and private structures to reduce energy consumption. In the next year, billions of dollars are being invested in this effort. The California Home Energy Rating System (HERS) Program is the main rating system for residential dwellings; commercial dwellings typically utilize the LEED rating systems.¹⁶
- **Deconstruction** involves disassembling a building or structure to salvage select components for re-use or recycling. This sub-sector primarily includes builders and contractors that are providing such services.
- **Green building operations and maintenance** is used to ensure that existing buildings remain energy efficient over time. This industry cluster largely focuses on identifying operating inefficiencies, reducing waste, and integrating sustainable materials and systems.
- **Green landscaping** reduces the consumption of natural resources by integrating native plants and grasses that require less watering and maintenance.¹⁷ The services of green landscaping are provided by some architectural firms specializing in landscape design and planning.
- **Energy services (ESCO)** companies manage full scale projects aimed at improving energy efficiency and ongoing maintenance costs for facilities over a seven to twenty year time period. Most ESCO companies manage the project from start to finish, including equipment installation, securing financing, and monitoring the project's energy savings.¹⁸

Biofuels Production & Farming is an area associated with producing alternative fuels and/or energy from biological products and waste, as well as incorporating environmentally friendly practices and principles in the overall farming process. The five biofuels production and farming industry clusters include:

- **Biofuels production** companies focus on manufacturing fuels that are typically derived from crops high in sugar or vegetable oils/fats. In the U.S., these fuels are primarily used to power vehicles.¹⁹
- **Biomass energy** is derived from recently living organism, such as plants, animals, or animal byproducts.²⁰
- **Organic farming** is a form of agriculture that limits the use of synthetic fertilizers and pesticides, promotes crop rotation, and cultivates soil productivity with natural manure and compost. One of the key goals is to ensure sustainable agriculture — the ability to produce on the land indefinitely.²¹

¹⁶ California Energy Commission, <http://www.energy.ca.gov/HERS/index.html>. U.S. Green Building Council, <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988>

¹⁷ U.S. Environmental Protection Agency, <http://www.epa.gov/greenacres>

¹⁸ National Association of Energy Service Companies, <http://www.naesco.org/>

¹⁹ Green Jobs: Towards decent work in a sustainable, low-carbon world

²⁰ National Renewable Energy Laboratory, <http://www.nrel.gov/biomass/>

²¹ National Sustainable Agricultural Information Services, <http://attra.ncat.org/organic/html>

- **Biomethane production** plants are involved in producing energy from landfills and animal waste. Landfill gas contains about 50 percent methane, which can be purified and fed into a natural gas grid.²² Animal waste also produces methane.
- **Sustainable fisheries** focus on conserving marine ecosystems and fish populations to ensure that they remain accessible to future generations.²³

Biofuels is separated from the Renewable Energy cluster to highlight the relationship among agriculture, farming, and biofuels production. This distinction is especially important in determining the scope of college programs. Most biofuels are produced from corn, sugarcane, and palm oil crops, which generate harmful greenhouse emissions and threaten biodiversity. Therefore, it is important to consider environmentally friendly agricultural and farming practices, as well as alternative methods to producing biofuels (such as the use of waste or forest byproducts).

Transportation & Alternative Fuels focuses on developing the technology, manufacturing and servicing vehicles that run on alternative fuels, and “greening” transportation infrastructure and logistics processes. Growth in this sector is largely being driven by legislative policies. Assembly Bill 118 has set aside millions of dollars for research and development of alternative fuels and vehicle technologies with the goal of improving California’s air quality.²⁴ The California Global Warming Act of 2006 (AB 32) mandates a statewide reduction of greenhouse gas emissions to 1990 levels by 2020, which will require a change in current vehicle emission standards.²⁵ The six transportation and alternative fuels industry clusters include:

- **Alternative fuel engine designs** are aimed at lowering greenhouse gas emissions or eliminating them altogether. The most common engine designs include hydrogen, electricity, biofuels, or hybrid.
- **Alternative vehicle manufacturing** is the mass production of alternative fuel vehicles. In California, smaller private organizations are beginning to compete with the traditional automobile companies by offering electrical, hydrogen, and other alternative fuel vehicles at increasingly reasonable prices.
- **Repair & maintenance services** are needed for a variety of alternative vehicles including hybrid/electrical, hydrogen/fuel cells, biofuels, and natural gas. Since alternative vehicles operate differently than traditional combustion engines, it requires a new set of skills, knowledge and abilities.
- **Fueling stations** (natural gas, hydrogen, electric, etc.) are necessary to service alternative fuel vehicles. In California, ethanol and biodiesel fuels are beginning to be offered at traditional gas stations. Liquid Natural Gas (LNG) and Compressed Natural Gas (CNG) fueling stations are typically privately owned and operated.
- **Electric Public Transit systems** use less energy and are less carbon intensive than automobiles. New design concepts in public transit are beginning to emerge, such as systems that service business parks to shorten overall commute times.
- **Logistics** involves implementing strategies to minimize the environmental impact of freight transport, warehousing, and materials handling. For example, GIS and scheduling

²² Energy Information Administration, Official Energy Statistics from the U.S. Government, <http://www.eia.doe.gov/>

²³ National Marine Fisheries Service, Office of Sustainable Fisheries, <http://www.nmfs.noaa.gov/sfa/>

²⁴ Assembly Bill No. 118, Nunez. Alternate fuels and vehicle technologies: funding programs

²⁵ Assembly Bill No. 32, Nunez. Air pollution: greenhouse gases: California Global Warming Solutions Act of 2006.

software are often used to schedule deliveries that help companies respond to changing road conditions. This helps to minimize costs as well as greenhouse gas emissions.²⁶

Water, Wastewater & Waste Management includes the development and operation of systems, connected with treatment and conservation of water, recycling of wastewater, and solid waste management. California is experiencing a severe draught, which has resulted in water rationing, fewer agricultural crops, the loss of thousands of jobs, and an overall decline in the state's economic health.²⁷ Further, the demand for water continues to increase as the state's population grows. As such, water conservation and waste management efforts are necessary to ensure that future generations have access to freshwater. The six water, wastewater and waste management industry clusters include:

- **Water shed conservation and management** involves implementing strategies to protect water quality, natural resources, and wildlife habitats.
- **Water supply and distribution** is an important function to water management. To optimize water use, several techniques are available including storm water capture, graywater recycling, ground-water replenishment and water conservation.
- **Water treatment** uses safe, low-toxic chemicals and/or non-chemical treatment systems to protect and treat water for consumption or continued use.
- **Wastewater treatment & management** uses environmentally friendly methods to clean waste water before returning it to the environment. Engineered wetlands are one of the greenest methods of performing this task.²⁸
- **Solid waste management/recycling** converts solid waste into usable products, such as pellets that can be burned to generate heat.
- **Hazardous waste management/recycling** takes steps to ensure that hazardous materials are contained and do not cause environmental damages.

Environmental Compliance & Sustainability Planning contains establishments and governmental agencies that plan, establish, execute and control environmental quality standards, usually in regards to air, water, land, and other environmental resources. These agencies also play a significant role in guiding and shaping the developments of the other five clusters.

- **Pollution prevention rule development and enforcement** is a role often taken on at a state level. In California, oversight or implementation may involve the California Environmental Protection Agency, Air Resources Board and Energy Commission. New legislation is typically assigned to a state agency to plan, establish, and implement guidelines that accomplish the objectives of the bill.
- **Conservation, cleanup and safety** are regulated to ensure the proper disposal of harmful substances/byproducts as well as the conservation of natural resources.
- **Urban planning** incorporates "smart growth" concepts to decrease pollution, strains on water supplies, as well as protect wildlife, farmland and open spaces.
- **Transportation systems planning** increases the efficiency of, and access to public transportation systems.

²⁶ Green Logistics, <http://www.greenlogistics.org/>

²⁷ California Department of Water Resources, Drought Conditions, 2009. <http://www.water.ca.gov/drought>

²⁸ U.S. Environmental Protection Agency, <http://www.epa.gov/ovm/>

Green Jobs Framework

The range of opportunities to work in the green economy is continuing to expand and the ultimate size and scope of the green job market is still unknown. The green occupational overview presented in the following table is designed to present a framework to create relationships between the green industry sectors and clusters discussed in the previous section; potential new/emerging green occupations; and traditional occupations that have the potential to go green in the future. Occupations selected for inclusion in this section support the value chain activities (Research and Development, Manufacturing, Distribution, Installation, and Maintenance & Repair) of the designated industry sectors and comply with the aforementioned criteria.

Green Economy area/sector	Green Industry Clusters	Emerging Green Occupations	Occupations with SOC Code
Renewable Energy: Energy Generation, System Installation & Storage	<p>Solar thermal & photovoltaic (PV) systems</p> <p>Wind energy power</p> <p>Hydro-electric power</p> <p>Geothermal power</p> <p>Smart grid</p> <p>Hydrogen power</p> <p>Energy storage</p> <p>Energy transmission/distribution</p> <p>Energy services (ESCO)</p>	<p>Solar power & PV systems:</p> <ul style="list-style-type: none"> Solar systems engineers Solar systems engineering technicians Solar manufacturing technicians Solar sales estimators Solar thermoelectric plant managers Solar systems designers Solar commercial installation engineers Solar installation electricians Solar installation electrician foremen Solar thermal system installers Solar PV installers (Proposed SOC: 49-9022 Solar panel installers and repairers) <p>Wind energy power:</p> <ul style="list-style-type: none"> Wind farm electrical systems designers Wind power plant project engineers Wind turbine electrical engineers Wind turbine mechanical engineers Wind power manufacturing technicians Wind turbine maintenance technicians Wind field technicians Wind turbine machinists <p>Next generation hydro power:</p> <ul style="list-style-type: none"> Ocean wave power turbine technicians <p>Geothermal power:</p> <ul style="list-style-type: none"> Geothermal electrical engineers Geothermal operations engineers Geothermal mechanical engineers 	<p>Engineers (including civil and electrical engineers*):</p> <ul style="list-style-type: none"> 17-2041 Chemical Engineers 17-2051 Civil Engineers 17-2071 Electrical Engineers 17-2072 Electronics Engineers 17-2081 Environmental engineers 17-2112 Industrial Engineers 17-2131 Materials engineers 17-2141 Mechanical engineers <p>Mapping technicians (17-3031.02)</p> <p>Technicians/Electrical technicians:</p> <ul style="list-style-type: none"> 17-3023 Electrical & electronics engineering technicians 17-3024 Electro-mechanical technicians 17-3025 Environmental engineering technicians 17-3027 Mechanical engineering technicians 17-3029 Engineering technicians, except drafters, all other <p>Commercial and industrial designers (27-1021)</p> <p>Assemblers:</p> <ul style="list-style-type: none"> 51-2022 Electrical and electronic equipment assemblers 51-2023 Electromechanical equipment assemblers 51-2031 Engine and other machine assemblers 51-2091 Fiberglass laminators and fabricators 51-2092 Team assemblers <p>Machinists, operators and inspectors:</p> <ul style="list-style-type: none"> 51-4041 Machinists 51-8012 Power distributors 51-8013 Power plant operators 51-8021 Stationary Engineers and Boiler Operators 51-9061 Inspectors, testers, sorters and weighers

Green Economy area/sector	Green Industry Clusters	Emerging Green Occupations	Occupations with SOC Code
<p>Renewable Energy: Energy Generation, System Installation & Storage, continued</p>		<p>Geothermal power plant structural engineers Geothermal plant efficiency operators Geothermal plant installation technicians Geothermal heat pump machinists</p> <p>Hydrogen Hydrogen plant operator and operations managers Hydrogen fuel cell engineers</p> <p>All renewables: Instrumentation/Controls/Electrical (ICE) systems technicians Renewable energy technicians Other energy engineers (<i>Proposed</i> SOC 17-2179 <i>Other energy engineers</i>)</p>	<p>Electrical and electronics repairers, powerhouse substation and relay (49-2095) Industrial machinery mechanics (hydroelectric machinery mechanics) (49-9041)</p> <p>Managers: 11-1021 General and operations managers 11-9041 Engineering managers</p> <p>Roofers (47-2181)</p> <p>Plumbers: 47-2152 Plumbers, pipefitters, and steamfitters 47-3015 Helpers-pipelayers, plumbers, pipefitters, and steamfitters</p> <p>Sheet metal workers (47-2211)</p> <p>Installers & Energy efficiency specialists: 17-3012 Electrical drafters 49-9012 Control and valve installers and repairers, except mechanical door 49-9021 Heating, air conditioning, and refrigeration mechanics and installers 49-9051 Electrical power-line installers and repairers</p> <p>Sales representatives: 41-4011 Sales representatives, wholesale and manufacturing, technical and scientific products 41-9031 Sales engineers 41-9041 Telemarketers</p> <p>Accountants (KSA of tax incentives, rebates, etc): 13-2011.01 Accountants</p> <p>Meter readers, utilities (43-5041)</p> <p>Hydrogeologists: 19-2042 Geoscientists</p> <p>Maintenance workers: 49-9042 Maintenance and repair workers, general 49-9043 Maintenance workers, machinery 49-9098 Helpers-installation, maintenance and repair workers</p>

Green Economy area/sector	Green Industry Clusters	Emerging Green Occupations	Occupations with SOC Code
<p>Green Building and Energy Efficiency</p>	<p>Green product manufacturing:</p> <ul style="list-style-type: none"> • Lighting • Construction materials • “Smart” systems & equipment • Water systems • HVAC/R equipment <p>Green construction materials wholesaling</p> <p>Energy services (ESCO)</p> <p>Design and construction of new buildings</p> <p>Retrofitting & retro-commissioning of existing structures</p> <p>Deconstruction</p> <p>Green building operations and maintenance</p> <p>Certifications (LEED)</p> <p>Green landscaping</p>	<p>Green product manufacturing: Other energy engineers (<i>Proposed SOC 17-2179 Other energy engineers</i>)</p> <p>Energy services: Field energy consultants Energy conservation representatives Energy managers and analysts Compliance analysts or Energy regulation specialists Residential energy field auditors (<i>Proposed SOC 25-9022 Home energy auditors</i>) Commercial and industrial energy field auditors</p> <p>Design and construction of new green buildings/Retrofitting of existing buildings/Deconstruction: Green building and retrofit architects Renewable energy consultants Industrial green systems and retrofit designers Environmental construction engineers Green building and retro-fitting project managers</p> <p>Green building operations and maintenance: Water purification systems service technicians Green building operators and engineers Green building maintenance engineer Building performance specialists:</p> <ul style="list-style-type: none"> • Weatherization specialists or technicians • Weatherization operations managers • Residential air sealing technicians • Building controls system technicians <p>Resource conservation or Energy efficiency managers</p>	<p>Engineers: 17-2051 Civil engineers (including structural design) 17-2071 Electrical engineers (including Lighting product and equipment engineers) 17-2112 Industrial Engineers 17-2131 Materials engineers 17-2141 Mechanical engineers (including Water systems designers and engineers, and HVAC/R engineers) 17-2151 Mining and geological engineers</p> <p>Technicians/Electrical technicians: 17-3012 Electrical drafters 17-3023 Electronics & electrical engineering technicians (including lighting product manufacturing technicians) 17-3024 Electro-mechanical technicians 17-3027 Mechanical engineering technicians (including HVAC/R product manufacturing technicians) 17-3029 Engineering technicians, except drafters, all other</p> <p>Fabricators and welders: 51-2041 Structural metal fabricators and fitters 51-4121 Welders, cutters, solderers, and brazers</p> <p>Interior designers (27-1025)</p> <p>Architects: 17-1011 Architects, except landscape and naval 17-1012 Landscape architects 17-3011 Architectural and civil drafters</p> <p>Maintenance and repair workers: 49-9042 Maintenance and repair workers, general</p> <p>Construction supervisors: 11-9021 Construction managers (including Project manager for construction and design work) 47-1011 First-line supervisors/managers of construction trades and extraction workers</p> <p>Cement masons and concrete finishers (47-2051)</p> <p>Carpenters: 47-2031 Construction carpenters</p>

Green Economy area/sector	Green Industry Clusters	Emerging Green Occupations	Occupations with SOC Code
<p>Green Building and Energy Efficiency, continued</p>		<p>Green landscaping: Green landscape architects</p>	<p>47-3012 Helpers-carpenters Roofing and skylight installers: 47-2121 Glaziers 47-2181 Roofers Insulation installers: 47-2131 Insulation workers, floor, ceiling and wall Electricians: 47-2111 Electricians 47-3013 Helpers-electricians Plumbers & HVAC/R: 47-2152 Plumbers, pipefitters, and steamfitters 47-3015 Helpers-pipe layers, plumbers, pipefitters, and steamfitters 49-9021 Heating and air conditioning and refrigeration mechanics and installers Sales representatives: 41-4011 Sales representatives, wholesale and manufacturing, technical and scientific products 41-9031 Sales engineers Cost estimators (13-1051) Energy efficiency specialists: 17-3012 Electrical drafters Inspectors: 47-4011 Construction and building inspectors</p>

Green Economy area/sector	Green Industry Clusters	Emerging Green Occupations	Occupations with SOC Code
<p>Biofuels & Farming</p>	<p>Biofuels production</p> <p>Biomass</p> <p>Organic farming practices</p> <ul style="list-style-type: none"> Natural pesticides <p>Biomethane production</p> <ul style="list-style-type: none"> Energy from animal waste Energy from landfills <p>Sustainable fisheries</p>	<p>Biofuel production & Biomass: Biofuel plant field technicians Biofuel production technicians Biodiesel/Biofuel technology & product development managers Biofuel plant field & operations engineers</p> <p>Landfill gas to energy (LGE): Landfill gas collection system operators Landfill gas system technicians</p> <p>Energy from animal waste: Biomethane gas collection system technicians Biomethane gas collection system operators</p> <p>Sustainable fisheries: Sustainable development specialists</p>	<p>Farmers and ranchers (11-9012)</p> <p>Agricultural engineers (17-2021)</p> <p>Civil engineers (17-2051) – agriculture/irrigation/water supply</p> <p>Lab technicians: 19-4011.01 Agricultural technicians 19-4021 Biological technicians 19-4031 Chemical technicians</p> <p>Scientists: 19-1013 Soil and plant scientists 19-1020 Biologists</p> <p>Managers: 11-9011 Farm, ranch and other agricultural managers 45.1011.07 First-line supervisors/managers of agricultural crop and horticulture workers</p> <p>Agricultural inspectors (45-2011)</p>

Green Economy area/sector	Green Industry Clusters	Emerging Green Occupations	Occupations with SOC Code
<p>Alternative Fuel Transportation</p>	<p>Alternative fuel engine design (hydrogen electrical, biofuels, hybrid)</p> <p>Alternative vehicle manufacturing</p> <p>Repair & maintenance of alternative vehicles</p> <ul style="list-style-type: none"> • Hybrid/electrical • Hydrogen/fuel cells • Biofuels • Natural gas, LNG & CNG <p>Fueling stations (natural gas, hydrogen, electric, etc.)</p> <p>Electric Public Transit</p> <p>Logistics</p>	<p>Alternative fuel engine design and vehicle manufacturing:</p> <p>Hybrid powertrain development engineers</p> <p>Powertrain control systems & software engineers</p> <p>Automotive power electronics engineers</p> <p>Repair & maintenance of alternative vehicles:</p> <p>Alternative fuel vehicle diagnosticians</p> <p>Natural gas vehicle technicians</p> <p>Biodiesel technicians</p> <p>Electrical or hybrid vehicle technicians</p> <p>Hydrogen/fuel cell vehicle technicians (Proposed SOC 49-3024 Hybrid and fuel cell automotive technicians and mechanics)</p> <p>Fueling stations:</p> <p>Program managers, environmental construction</p> <p>Alternative fueling station designers & project engineers</p> <p>Fueling facility technicians²⁹</p> <p>Emission control technology specialist</p>	<p>Engineers:</p> <p>17-2071 Electrical engineers</p> <p>17-2072 Electronics engineers</p> <p>15-1030 Computer software engineers</p> <p>Assemblers & fabricators:</p> <p>51-2031 Engine and other machine assemblers</p> <p>51-2041 Structural metal fabricators and fitters</p> <p>51-2092 Team assemblers</p> <p>Electronic equipment installers, repairers, motor vehicles (49-2096)</p> <p>Technicians:</p> <p>17-3023 Electronics and electrical engineering technicians</p> <p>17-3025 Environmental engineering technicians</p> <p>17-3027 Mechanical engineering technicians</p> <p>Welders:</p> <p>51-4121 Welders, cutters, solderers and brazers</p> <p>51-4122 Welding, soldering, and brazing machine setters, operators and tenders</p> <p>Electricians (47-2011)</p> <p>Automotive mechanics:</p> <p>49-3020 Automotive technicians and repairers</p> <p>49-3031 Bus and truck mechanics and diesel engine specialists</p> <p>Mapping technicians (17-3031.02)</p>

Skills set may vary depending on type of fueling station/facility.

Green Economy area/sector	Green Industry Clusters	Emerging Green Occupations	Occupations with SOC Code
<p>Water and Wastewater Management</p>	<p>Water shed conservation and management Water supply and distribution (storm water capture, water recycling, ground-water replenishment and water conservation) Water treatment Wastewater treatment & management Solid waste management/recycling Hazardous waste management/recycling</p>	<p>Water shed conservation and management: Water conservation consultants Sustainable development specialists Water supply and distribution: Water resource consultants Water conservation or water efficiency specialists GIS Technicians GIS Analysts Water and wastewater treatment: Water/wastewater consultants Environmental chemists Environmental biologists Solid waste management/recycling: Waste reduction consultants Destruction technicians</p>	<p>Engineers: 17-2081 Environment engineers 17-2141 Mechanical engineers (including water systems designers and engineers) Technicians: 17-3025 Environmental engineering technicians 17-3027 Mechanical engineering technicians Instrument and control technicians: 49-9012 Control & valve installers and repairers, except mechanical door Industrial machinery mechanics (49-9041) Machinists (51-4041) Inspectors, testers, sorters, and weighers (51-9061) Maintenance and repair workers: 49-2092 Electric motor, power tool and related repairers 49-9042 Maintenance and repair workers, general 49-9043 Maintenance workers, machinery 49-9098 Helpers-installation, maintenance, & repair workers Plumbers: 47-2152 Plumbers, pipefitters, and steamfitters 47-3015 Helpers-pipe layers, plumbers, pipefitters, & steamfitters Meter readers, utilities (43-5041) Water and water treatment plant operators: 51-8021 Stationary engineers and boiler operators 51-8031 Water & liquid waste plant & system operators Soil and water conservation specialists: 19-1031 Conservation scientists 19-4091 Environmental science & protection techs, incl. health Refuse and recyclable material collectors (53-7081) Hazardous materials removal workers (47-4041) Environmental health & safety engineers and technicians: 13-1041.01 Environmental compliance inspectors 29-9011 Occupational health and safety specialists Hydrologists (19-2043)</p>

Green Economy area/sector	Green Industry Clusters	Emerging Green Occupations	Occupations with SOC Code
<p>Environmental Compliance and Sustainability Planning</p>	<p>Pollution prevention rule development and enforcement</p> <p>Conservation, cleanup and safety</p> <p>Urban planning</p> <p>Transportation systems planning</p>	<p>Pollution prevention rule development and enforcement:</p> <ul style="list-style-type: none"> Climate change and energy policy specialist Conservation policy analysts Alternative fuels policy analysts Air emissions permitting engineer Energy trading specialist <p>Conservation, cleanup and safety:</p> <ul style="list-style-type: none"> Environmental researchers Environmental laboratory technicians Sustainability program specialists (Proposed SOC 13-1112 Sustainability program specialists) <p>Urban planning & transportation systems planning:</p> <ul style="list-style-type: none"> Urban renewal managers Alternative fuels policy analysts Sustainability planners Sustainability program specialists (Proposed SOC 13-1112 Sustainability program specialists) Energy trading specialist Air emissions permitting engineer 	<p>Environmental inspectors and auditors:</p> <ul style="list-style-type: none"> 13-1041.01 Environmental compliance inspectors <p>Environmental health & safety engineers and technicians:</p> <ul style="list-style-type: none"> 17-2081 Environmental engineers 17-2111.01 Industrial safety and health engineers 17-2151 Mining and geological engineers, including mining safety engineers 17-3025 Environmental engineering technicians 19-2041 Environmental scientists and specialists, including health 19-4021 Biological technicians 19-4031 Chemical technicians 19-4091 Environmental science and protection technicians, including health 29-9011 Occupational health and safety specialists 29-9012 Occupational health and safety technicians <p>Urban and regional planning specialists (including transportation planning aides):</p> <ul style="list-style-type: none"> 11-3071.01 Transportation managers 15-2041 Statisticians 19-3011 Economists 19-3051 Urban and regional planner 19-4061.01 City and regional planning aides 53-6041 Traffic technicians <p>Soil and water conservation technicians:</p> <ul style="list-style-type: none"> 19-1031.01 Soil and water conservationists 19-4093 Forest and conservation technicians <p>Farm and home management advisors (25-9021)</p>

The Standard Occupational Classification (SOC) system is used by Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data.³⁰ Workers are classified into specific occupations according to their occupational definition. The green occupational framework presents occupations with SOC codes (traditional occupations) as well as emerging green occupations. The occupations with SOC codes are included based on the assumption that these jobs will require new or additional training in the emerging green economy. Although the emerging green occupations will also require new or additional knowledge, skills and abilities, they are primarily defined as 'emerging' by the distinction that they have not yet been classified into the SOC system and therefore no employment information can be easily obtained for them. There are several emerging green occupations listed that show proposed SOC codes. These proposed codes have been developed by the California Employment Development Department.

It is the intent of the occupational crosswalk to look at the green economy as a whole, but also to segregate the information by industry sectors and clusters to better understand the individual clusters and the specific occupations and job opportunities that may exist within each area. As a result, many job titles are duplicated throughout the table since they impact multiple green sectors.

Upon closer examination, it should be noted that the occupations within the individual industry sectors represent the value chain of activities associated with the specific industry sectors. For example, occupations associated with the Renewable Energy: Energy Generation, System Installation & Storage sector include the following:

- Engineers, Commercial and Industrial Designers (Research and Development);
- Assemblers and Machinists (Manufacturing);
- Sales Representatives, Sales Engineers, and Telemarketers (Distribution);
- Installers and Energy Efficiency Specialists (Installation); and
- Technicians and Maintenance Workers (Maintenance and Repair).

Similar patterns exist across each of the industry sectors.

Positions such as human resources, payroll, office management, etc. have not been included in the Green Jobs Framework. While individuals employed in these occupations may work for green firms, they will not typically be working directly with new green technologies and the successful performance of their jobs will not require new knowledge, skills and abilities. It should also be noted that some of the occupations presented in the crosswalk (e.g. machinists and assemblers) may experience growth in certain industries without a need for new or additional training. For example machinists may experience increased production of bolts to meet an increased demand for wind turbines. While the occupation itself may experience growth, no new skills will be needed for successful job performance. These occupations would be classified into the O*NET Green Increased Demand Occupations referenced earlier in this report.

³⁰ Online source: www.bls.gov

Taxonomy of Programs Crosswalk

The occupational framework described above identifies those industries and occupations that fit within the six defined green sectors. Ultimately, community colleges have expressed interest in utilizing the framework to identify:

- Which existing courses offered are, or could be contributors to training a green workforce?
- Given that many green occupations are interdisciplinary, within which college departments should green programs be housed?
- Which departments should be convened to adopt or repackage existing programs?
- How many green courses/programs/completers is a given college, or the California Community College system, providing to the state's economy?

To address these questions appropriately, a clear distinction must be made between 'traditional' and 'emerging green occupations' as well as the methodology and challenges inherent in identifying college programs for each. 'Traditional occupations' include those presented as **Occupations with SOC Codes** in the Green Jobs Framework. The argument can be made that some of the occupations classified as **Emerging Green Occupations** may also be viewed as traditional occupations in that they are not necessarily new. For example, solar manufacturing technicians have been serving the solar industry for at least 20 years, yet this occupation is still classified as an emerging green occupation because it does not have a unique SOC code.

Traditional Green Occupation Programs

Traditional green occupations are not necessarily new to the community college system. In fact, there is a multitude of training programs already in place for the 101 traditional green occupations (those with SOC codes) identified herein. To identify the courses and programs that train for these green jobs, the crosswalk previously co-developed by the California Community College Chancellor's Office (CCCCO) and the California Employment Development Department (EDD) was referenced.³¹ This three-step crosswalk linked community college courses [using the Taxonomy of Program (TOP) system] to nationally adopted instructional program codes Classification of Instructional Programs (CIP), and finally to existing occupations (using the SOC system).

What is a TOP Code?

The Taxonomy of Program (TOP) is a system of numerical codes used within the state of California to collect and report information on programs and courses in different community colleges throughout the state that have similar outcomes. First published in 1979, the TOP was designed to aggregate information about programs. However, a TOP code must also be assigned to every course in our system.¹

What is a CIP Code?

The Classification of Instructional Programs (CIP) was originally developed by the U.S. Department of Education's National Center for Education Statistics in 1980 to provide a taxonomic scheme that will support the accurate tracking, assessment, and reporting of fields of study and program completions activity. CIP codes are used nationwide in K-14 systems. The 2000 edition used for this crosswalk is the third revision of the taxonomy which presents an updated taxonomy of instructional program classifications and descriptions

³¹ This crosswalk is available at: <http://labormarketinfo.edd.ca.gov/CommColleges/>

The purpose of the previous crosswalk, however, was different from our present research objectives. Thus there were some data limitations and missing TOP codes when constructing our “Green TOPs” crosswalk. For example, since the CIP codes were used to link California’s college programs and the occupations, there are some occupations that are not included in the EDD/CCCCO crosswalk (e.g. many engineering positions). In order to fill these gaps, the Centers of Excellence checked every occupation and TOP code for accurate linkages. The Chancellor’s Office staff reviewed and verified the draft crosswalk and, in many instances assigned the XX99.00 TOP code since there is not an assigned TOP code for all new courses and programs developed to meet the educational and training needs of new and emerging technologies.

The result is a listing of community college programs specifically linked to each traditional green occupation and each corresponding green sector found in Appendix D. Community colleges can use this listing to identify existing programs that can be repackaged into interdisciplinary green programs and the CCCCCO can reference this listing in reporting the number of for-credit green programs within the system.³² Colleges outside of California and K-12 educational partners can access an expanded version of the spreadsheet that includes CIP codes for the occupations listed in the crosswalk. This spreadsheet is available at www.coecc.net/green.

Emerging Green Occupations

By definition, the emerging green occupations listed herein do not have a prescribed Standard Occupation Code to aid in identifying related instructional programs. Although previous environmental scans completed by the Centers of Excellence list many TOP codes and instructional programs that train for specific emerging green occupations (see Appendix B for a listing of completed reports), providing a comprehensive program listing similar to the traditional TOPs crosswalk requires extensive additional research to ensure programs are not unintentionally excluded.

Moving forward, the Centers of Excellence will collaborate with the California Community College Chancellor’s Office to revise the existing TOPs crosswalk and to identify programs that contribute to the training and education of emerging green occupations. The Centers of Excellence will also reach out to community college subject matter experts to help identify the TOP codes and programs which help prepare California’s labor force for the six green industry sectors presented in this report.

³² This listing excludes of green TOPs excludes not-for-credit, fee-based, and contract education courses and/or programs which also provide training for many green occupations. A comprehensive evaluation of the community colleges’ contribution to the green economy should take this into account. These program completion statistics are presently collected separately from the system’s Management Information System.

Conclusion

The Green Economy Framework presented in this report is a valuable resource for community colleges as they begin to tackle the complexities of “going green” and what that means in terms of providing training and educational services. At a minimum, this report is designed to help community colleges reduce the confusion, skepticism, and misunderstanding of the green economy. Optimally, it will help community colleges better understand the green economy at a relevant and meaningful level so they are positioned and ready to respond to its needs. The American Reinvestment and Recovery Act (ARRA) has dramatically increased interest in the green movement. Additionally, the current California budget crisis will force community colleges to make difficult decisions about course offerings and programs.

On a more practical level, community college administrators, career and technical education (CTE) faculty, grant writers, and institutional researchers will be able to begin to evaluate training programs and courses relative to the emerging green economy. This framework can be used to:

- Identify existing occupational training programs related to traditional occupations with SOC codes (e.g. Machinist);
- Relate those occupational programs to new and emerging occupational areas (e.g. Wind Turbine Machinists)
- Get a sense of how those occupational programs relate to emerging industry clusters and sectors (Wind Energy Power); and
- Understand how they relate to the six major green industry sectors identified in the crosswalk (Renewable Energy: Energy Generation, System Installation & Storage).
- Use this information to create regional partnerships and responses to green industry needs.

This information can provide a starting point for program modification and new program planning. This type of evaluation and assessment will become even more important through the lens of the ARRA dollars. Significant ARRA resources have been identified for green building and energy efficiency. Figure 2 provides an example of how the framework might be applied starting with Green Building and Energy Efficiency as the major green industry sector and culminating in new community college programs to meet specific industry needs.

Figure 2: Occupational Program Development Utilizing the Green Economy Framework



At this time reliable labor market data is not available, even for occupations that are classified under SOC codes, as not all jobs within an SOC category are necessarily “green” but rather potentially green. For this reason, employment projections are not being attached to this framework at this time. However, California’s Employment Development Department is conducting its survey of employers to begin to get a sense of the types and numbers of green jobs in today’s economy. The Centers of Excellence have completed a number of environmental scans focusing on various green industry sectors and occupations. These scans generally include primary research and provide meaningful data and information on new and emerging industries and occupations. A complete list of these scans can be found in Appendix B of this report. They are all available to download at the Center of Excellence website at **www.coecc.net/green**.

This framework is a “living document” for the Centers of Excellence; the same can be said for community colleges. The Center of Excellence initiative will use this green economy framework to begin focused industry and/or occupational studies within the six subsectors identified in the industry crosswalk. These studies will include primary research to identify statewide, regional and local green economy workforce development needs. Community colleges are encouraged to use the framework to evaluate and assess their current course and program offerings for future planning.

References

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- Clean, secure energy and economic growth: A commitment to renewable energy and enhanced energy independence,
http://www.ny.gov.governor/press/lt_RETF_Report.pdf
- Green Careers Resource Guide, <http://www.cassio.com/GreenCareersResourceGuide.pdf>
- Green collar jobs – an analysis of the capacity of Green businesses to provide high quality jobs to men and women with barriers to employment,
<http://bss.sfsu.edu/raquelrp/documents/v13FullReport.pdf>
- Green Logistics: Research into the sustainability of logistic systems and supply chains,
<http://www.greenlogistics.org/PageView.aspx?id=97&tid=97>
- Green Jobs Guidebook: Employment Opportunities in the New Clean Economy.
www.edf.org/cagreenjobs
- Green Jobs: Towards Decent Work in a Sustainable, Low Carbon World, WorldWatch Institute
- Greener pathways: Jobs and workforce development in the clean energy economy,
<http://www.cows.org/pdf/rp-greenerpathways.pdf>
- Greening of the World of Work: Implications for O*NET-SOC and New and Emerging Occupations, <http://www.onetcenter.org/reports/green.html>
- Jobs in LA’s green technology sector,
http://www.economicrt.org/summaries/Green_Tech_synopsis.html
- The Future of Geothermal Energy, Massachusetts Institute of Technology
- National Association of Energy Companies, <http://www.naesco.org/default.htm>
- U.S. Department of Labor ETA – Occupational Outlook (www.doleta.gov)

Appendix A: How to Utilize this Report

This report is designed to provide a framework to define and understand the green economy. It:

- Creates operational definitions of green firms and green jobs that are relevant to community colleges;
- Classifies the green economy into major sectors or areas and develop an outline of green emerging industries and subsectors included in each sector;
- Develops a crosswalk between green industry sectors and green occupations that require specialized training, but currently are not classified under the Standard Occupational (SOC) system;
- Outline a list of occupations that currently have an SOC code and could be re-trained for the emerging green jobs within each industry sector; and
- Builds a crosswalk between the specified occupations with SOC codes and community college programs that currently train for these occupations as defined by the California Community College Taxonomy of Occupational Programs (TOP) systems.

The information in this report has been validated by a panel of employers, economic development professionals, and educators. Given the complex nature of the green economy and its continuing evolution, this framework should be considered a starting point as it will undergo future revisions as more becomes known about the direction of the various green industry sectors and occupations.

About the Centers of Excellence

The Centers of Excellence (COE), in partnership with business and industry, deliver regional workforce research customized for community college decision making and resource development. This information has proven valuable to colleges in beginning, revising, or updating economic development and Career Technical Education (CTE) programs, strengthening grant applications, assisting in the accreditation process, and in supporting strategic planning efforts.

The Centers of Excellence Initiative is funded in part by the Chancellor's Office, California Community Colleges, Economic and Workforce Development Program. The total grant amount (grant number 08-305-021 for \$205,000) represents funding for multiple projects and written reports through the Center of Excellence. The Centers aspire to be the premier source of regional economic and workforce information and insight for California's community colleges. More information about the Centers of Excellence is available at www.coecc.net.

Important Disclaimer

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings; however, neither the Centers of Excellence, COE host District, nor California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon components or recommendations contained in this study.

Appendix B: Environmental Scans, Focus on the Green Economy

<p>Energy Efficiency Occupations At-a-Glance Bay Area /2007</p>	<p>This report focuses on occupations related to energy efficiency in the residential, commercial and industrial buildings sector. These jobs are projected to grow significantly in the Bay Area as employers and individuals invest in energy efficiency projects.</p>
<p>Energy Efficiency Occupations Bay Area /2009 <i>Key Findings report also available.</i></p>	<p>In 2009, the San Francisco Bay and Greater Silicon Valley Centers of Excellence studied eight energy efficiency occupations that are most relevant to community colleges. This environmental scan's findings are based on survey responses from more than 700 firms that have energy efficiency workers in the 12-county Bay Area. Employers are projected to add as many as 13,000 new jobs over the next three years in this cluster of occupations.</p>
<p>Green Building Occupation Profiles Los Angeles /2007</p>	<p>This publication augments the environmental scan entitled Green Building and Construction: Los Angeles County.</p>
<p>Green Building Related Programs Los Angeles /2007</p>	<p>This publication augments the environmental scan entitled Green Building and Construction: Los Angeles County.</p>
<p>Green Building and Construction Scan Los Angeles /2007</p>	<p>A recent survey of construction companies in Southern California found that 25% have worked on a green project, a number expected to increase to 50% over the next several years.</p>
<p>Green Economy Workforce Study Scan Central Valley /2008 <i>Key Findings report also available.</i></p>	<p>Based on a 2008 survey of Central Valley businesses in energy, building and design services, engineering and environmental services, as well as government and public administration, over 79% of employers indicated that the green economy will be important in focusing their future products and services.</p>
<p>Green Industries & Jobs in California Preview Report California – Statewide /2009 <i>Key Findings report also available.</i></p>	<p>The Green Industries & Jobs report previews a study of the green economy and green jobs launched in 2008 by the Centers of Excellence. This document details the COE approach to identifying green industries and occupations, and includes, where possible, preliminary data and information, and related existing community college training programs.</p>

Green Study webpage → www.coeccc.net/green

<p>Heating, Ventilation, and Air Conditioning Occupations</p> <p>Scan</p> <p>Los Angeles /2008</p>	<p>California's long-term energy goals call for transforming heating, ventilation and air conditioning (HVAC) to ensure optimal energy performance for the state's climate. In Los Angeles, more than 600 annual job openings are projected for the four HVAC occupations profiled. By 2014, over 20,000 people will be employed in these positions in the county.</p>
<p>Line Installers and Repairers</p> <p>At-a-Glance</p> <p>Greater Sacramento /2007</p>	<p>The line installers and repairers report intersects two industries—electric power and telecommunications. With above average earnings and a projected growth and replacement rate of almost 60%, this represents a training opportunity for community colleges.</p>
<p>Solar Energy</p> <p>At-a-Glance</p> <p>Bay Area /2006</p>	<p>California is emerging as the world's third largest solar market. Industry and financial analysts forecast 20% annual growth in solar energy and projections estimate an increase of between 22,400 and 41,600 solar industry jobs by 2020.</p>
<p>Solar Industry</p> <p>Scan</p> <p>Bay Area /2008</p> <p><i>Key Findings report also available.</i></p>	<p>Based on a 2008 survey of solar and solar-related businesses in the Bay, solar occupations in greatest demand will grow by an average of nearly 50% over the next 12 months. This growth is projected to create almost 1,900 new jobs in the Bay.</p>
<p>Solar Industry</p> <p>Scan</p> <p>Greater Sacramento /2008</p> <p><i>Key Findings report also available.</i></p>	<p>Based on a 2008 survey of solar and solar-related businesses in the Greater Sacramento area, solar occupations in greatest demand will grow by an average of nearly 40% over the next 12 months. This growth is projected to create almost 310 new jobs in the Greater Sacramento area.</p>
<p>Solar Industry</p> <p>Scan</p> <p>Southern California /2008</p> <p><i>Key Findings report also available.</i></p>	<p>Based on a 2008 survey of solar and solar-related businesses in the Los Angeles and California, solar occupations in greatest demand will grow by an average of nearly 77% in the 6-county southern California. This growth is projected to create almost 750 new jobs in the Los Angeles solar industry.</p>
<p>Solar Technicians</p> <p>Scan</p> <p>California - Statewide /2008</p> <p><i>Key Findings report also available.</i></p>	<p>With the accelerated growth of the solar industry, demand for installers and repairers is high. California presently accounts for 73% of all solar installations nationwide and is projected to create more than 4,000 installer and technician jobs by 2015.</p>

Solar Study webpage → www.coeccc.net/solar

Utilities Industry Scan Los Angeles County /2008	Consistent with California's average, approximately one in 143 workers (0.7%) in Los Angeles County was employed by the utilities industry in 2006. Utilities employment in Los Angeles is projected to increase 4.5% from 2006 to 2014, resulting in 1,290 new jobs.
Water Efficiency Technology Scan Greater Sacramento /2008	A recent survey of plumbing employers in the Greater Sacramento area revealed that nearly half (48%) of plumbing businesses in the region will add new employees while more than one-third (38%) expect to stay the same size in the next 12 months.
Water Operators Scan Los Angeles County /2008	There are 2,350 Water Operators in Los Angeles County, and many of them are Baby Boomers who will soon leave the industry. Forecasts indicate a need for 578 new Water Operators in the next five years.
Wind Energy At-a-Glance Bay Area /2005	Transitioning from a fossil fuel-based economy to a renewably powered one is projected to yield over 3.3 million jobs over a period of 10 years with a \$300 billion investment. In California, the potential exists to create thousands of jobs.

Download reports at the COE website → www.coeccc.net/products_industry_scans

Appendix C: Industry, Economic Development and Educational Partners

The following individuals served on a panel to validate the industry and occupational matrices that became the green economy framework presented in this report. Their collective subject matter expertise across the green economy was instrumental in the production of this report.

Tim O'Connor, Environmental Defense Fund

Gregory Freeman, LA County Economic Development Corporation (LAEDC)

Bonnie Graybill and Staff, EDD Labor Market Information Division

Jon Dougal, Solar Energy Council

Linda Parker, Kern Wind Energy Association

Curtis Cormane, Main Street Architects

Bill Buratto, Ventura County Economic Development Association

Kristine Mazzel, Valley Vision

Jose Ramirez, Sacramento Regional County Sanitation District, Sacramento Area Sewer District

Greg Newhouse, Advanced Transportation Technology & Energy Center (ATTE), California Community Colleges

Richard Della Valle, Environment, Health, Safety & Homeland Security Centers, California Community Colleges

Larry Dutto, College of the Sequoias, Career & Technical Education

Appendix D: Crosswalk between Green Occupations and College Programs

TOP Code

The Taxonomy of Program (TOP) is a system of numerical codes used within the state of California to collect and report information on programs and courses in different community colleges throughout the state that have similar outcomes. First published in 1979, the TOP was designed to aggregate information about programs. However, a TOP code must also be assigned to every course in the California Community College System. The Center of Excellence green occupations crosswalk uses the 6th edition which is publicly available at www.cccco.edu.

CIP Code

The Classification of Instructional Programs (CIP) was originally developed by the U.S. Department of Education's National Center for Education Statistics in 1980 to provide a taxonomic scheme that will support the accurate tracking, assessment, and reporting of fields of study and program completion activity. CIP codes are used nationwide by K-14 systems. The 2000 edition used for this crosswalk is the third revision of the taxonomy which presents an updated taxonomy on instructional program classifications and descriptions. Crosswalks specifically for CIP codes are publicly available at nces.ed.gov

Crosswalk between Related Green Occupations and College Programs (TOP codes)

Green Economy area/sector	Green Occupations with SOC code*	Related TOP Code	TOP Program Title
Renewable Energy: Energy Generation, System Installation & Storage	11-1021 General and operations managers	050100	Business and Commerce, General
		050500	Business Administration
		050600	Business Management
		050800	International Business and Trade
		210200	Public Administration
	11-9041 Engineering managers	090100	Engineering, General
	13-2011.01 Accountants	050200	Accounting
		050210	Tax Studies
	17-2041 Chemical Engineers	092400	Engineering Technology, General
	17-2051 Civil Engineers	092400	Engineering Technology, General
	17-2071 Electrical engineers	092400	Engineering Technology, General
	17-2072 Electronics engineers	092400	Engineering Technology, General
	17-2081 Environmental engineers	099900	Other Engineering & Related Industrial Tech
	17-2112 Industrial engineers	099900	Other Engineering & Related Industrial Tech
	17-2131 Materials engineers	099900	Other Engineering & Related Industrial Tech
17-2141 Mechanical engineers	092400	Engineering Technology, General	
17-3024 Electro-mechanical technicians	094330	Vacuum Technology	

Crosswalk between Related Green Occupations and College Programs (TOP codes)

Green Economy area/sector	Green Occupations with SOC code*	Related TOP Code	TOP Program Title
Renewable Energy, Energy Generation, System Installation & Storage, continued		099900	Other Engineering & Related Industrial Tech
	17-3025 Environmental engineering technicians	099900	Other Engineering & Related Industrial Tech
	17-3027 Mechanical engineering technicians	094500	Industrial Syst. Technology and Maintenance
	17-3029 Engineering technicians, except drafters, all other	093480	Laser and Optical Technology
		094330	Vacuum Technology
		094610	Energy Systems Technology
		095420	Plastics and Composites
		096100	Optics
		099900	Other Engineering & Related Industrial Tech
		193000	Earth Science
	19-2042 Geoscientists		
	41-4011 Sales representatives, wholesale and	050940	Sales and Salesmanship
	41-9031 Sales engineers	050940	Sales and Salesmanship
	41-9041 Telemarketers	059900	Other Business and Management
	47-2152 Plumbers, pipefitters, and steamfitters	095230	Plumbing, Pipefitting and Steamfitting
	47-2181 Roofers	095290	Roofing
	47-3015 Helpers-pipelayers, plumbers, pipefitters, and	095230	Plumbing, Pipefitting and Steamfitting
	49-2095 Electrical and electronics repairers, powerhouse	093440	Electrical Systems and Power Transmission
	49-9012 Control and valve installers and repairers,	099900	Other Engineering & Related Industrial Tech
	49-9021 Heating, A/C, and refrig. mechanics & installers	094600	Environmental Control Technology
	49-9041 Industrial machinery mechanics (hydroelectric)	095630	Machining and Machine Tools
	49-9042 Maintenance and repair workers, general	095700	Civil and Construction Management Technology
	49-9043 Maintenance workers, machinery	095630	Machining and Machine Tools
	49-9051 Electrical power-line installers and repairers	093440	Electrical Systems and Power Transmission
	49-9098 Helpers-installation, maint. & repair workers	099900	Other Engineering & Related Industrial Tech
	51-2022 Electrical and electronic equipment assemblers	93420	Industrial Electronics
		093430	Telecommunications Technology
	51-2023 Electromechanical equipment assemblers	093500	Electro-Mechanical Technology
	51-2031 Engine and other machine assemblers	094720	Heavy Equipment Maintenance
	51-2091 Fiberglass laminators and fabricators	099900	Other Engineering & Related Industrial Tech
	51-2092 Team assemblers	099900	Other Engineering & Related Industrial Tech
51-4041 Machinists	095630	Machining and Machine Tools	
51-8012 Power distributors	099900	Other Engineering & Related Industrial Tech	
51-8013 Power plant operators	099900	Other Engineering & Related Industrial Tech	
51-8021 Stationary engineers and boiler operators	099900	Other Engineering & Related Industrial Tech	
51-9061 Inspectors, testers, sorters and weighers	095680	Industrial Quality Control	

Crosswalk between Related Green Occupations and College Programs (TOP codes)

Green Economy area/sector	Green Occupations with SOC code*	Related TOP Code	TOP Program Title
Green Building and Energy Efficiency	11-9021 Construction managers	050500	Business Administration
		050100	Business and Commerce, General
		050600	Business Management
	13-1051 Cost estimators	050100	Business and Commerce, General
		050500	Business Administration
		050600	Business Management
	17-1011 Architects, except landscape and naval	029900	Other Architecture and Environmental Design
	17-1012 Landscape architects	020110	Landscape Architecture (transfer)
	17-2051 Civil Engineers	092400	Engineering Technology, General
	17-2071 Electrical engineers	092400	Engineering Technology, General
	17-2112 Industrial engineers	099900	Other Engineering & Related Industrial Tech
	17-2131 Materials engineers	099900	Other Engineering & Related Industrial Tech
	17-2141 Mechanical engineers	092400	Engineering Technology, General
	17-2151 Mining & geological engineers, incl. mining	099900	Other Engineering & Related Industrial Tech
	17-3011.01 Architectural & civil drafters	020100	Architecture and Architectural Technology
		095300	Drafting Technology
		095310	Architectural Drafting
		095320	Civil Drafting
	17-3012 Electrical drafters	095330	Electrical, Electronic, & Electro-Mech. Drafting
	17-3023 Electrical & electronics engineering technicians	093400	Electronics and Electric Technology
	17-3024 Electro-mechanical technicians	094330	Vacuum Technology
		099900	Other Engineering & Related Industrial Tech
	17-3027 Mechanical engineering technicians	094500	Industrial Systems Technology and Maintenance
	17-3029 Engineering technicians, except drafters, all other	093480	Laser and Optical Technology
		094330	Vacuum Technology
		094610	Energy Systems Technology
		095420	Plastics and Composites
		096100	Optics
		099900	Other Engineering & Related Industrial Tech
	27-1025 Interior designers	130200	Interior Design and Merchandising
	41-4011 Sales representatives, wholesale and	050940	Sales and Salesmanship
	41-9031 Sales engineers	050940	Sales and Salesmanship
	47-1011 First-line supervisors/managers of construction trades and extraction workers	093440	Electrical Systems and Power Transmission
		095210	Carpentry

Crosswalk between Related Green Occupations and College Programs (TOP codes)

Green Economy area/sector	Green Occupations with SOC code*	Related TOP Code	TOP Program Title
Green Building and Energy Efficiency, continued		095220	Electrical
		095230	Plumbing, Pipefitting and Steamfitting
		095240	Glazing
		095260	Masonry, Tile, Cement, Lath and Plaster
		095270	Painting, Decorating, and Flooring
		095280	Drywall and Insulation
		095290	Roofing
		095700	Civil and Construction Management Technology
		095720	Construction Inspection
		210210	Public Works
		095210	Carpentry
		095260	Masonry, Tile, Cement, Lath and Plaster
		095220	Electrical
		095240	Glazing
		210210	Public Works
		095230	Plumbing, Pipefitting and Steamfitting
		095290	Roofing
		095210	Carpentry
		095220	Electrical
		095230	Plumbing, Pipefitting and Steamfitting
		095720	Construction Inspection
	094600	Environmental Control Technology	
	095700	Civil and Construction Management Technology	
	095640	Sheet Metal and Structural Metal	
	095650	Welding Technology	
	47-2031	Construction carpenters	
	47-2051	Cement masons and concrete finishers	
	47-2111	Electricians	
	47-2121	Glaziers	
	47-2131	Insulation workers, floor, ceiling and wall	
	47-2152	Plumbers, pipefitters, and steamfitters	
	47-2181	Roofers	
	47-3012	Helpers-carpenters	
	47-3013	Helpers-electricians	
	47-3015	Helpers-pipelayers, plumbers, pipefitters,...	
	47-4011	Construction and building inspectors	
	49-9021	Heating, A/C, and refrig. mechanics & installers	
	49-9042	Maintenance and repair workers, general	
	51-2041	Structural metal fabricators and fitters	
	51-4121	Welders, cutters, solderers, and brazers	

Crosswalk between Related Green Occupations and College Programs (TOP codes)

Green Economy area/sector	Green Occupations with SOC code*	Related TOP Code	TOP Program Title
Biofuels/Farming	11-9011 Farm, ranch and other agricultural managers &	010200	Animal Science
	11-9012 Farmers and ranchers	010220	Artificial Inseminator (Licensed)
		010230	Dairy Science
		010300	Plant Science
		010310	Agric. Pest Control Adviser and Operator (Licensed)
		010400	Viticulture, Enology, and Wine Business
		010930	Nursery Technology
		011200	Agriculture Business, Sales and Service
	17-2021 Agricultural engineers	019900	Other Agriculture and Natural Resources
	17-2051 Civil Engineers	092400	Engineering Technology, General
	19-1013 Soil and plant scientists	010100	Agriculture Technology and Sciences, Gen
	19-1020 Biologists	049900	Other Biological Sciences
	19-4011.01 Agricultural technicians	019900	Other Agriculture and Natural Resources
	19-4021 Biological technicians	043000	Biotechnology and Biomedical Technology
	19-4031 Chemical technicians	095400	Chemical Technology
	45.1011.07 First-line supervisors/managers of	019900	Other Agriculture and Natural Resources
	45-2011 Agricultural inspectors	010200	Animal Science
	010300	Plant Science	

Crosswalk between Related Green Occupations and College Programs (TOP codes)

Green Economy area/sector	Green Occupations with SOC code*	Related TOP Code	TOP Program Title
Transportation/ Alternative Fuel	15-1030 Computer software engineers	070700	Computer Software Development
	17-2071 Electrical engineers	092400	Engineering Technology, General
	17-2072 Electronics engineers	092400	Engineering Technology, General
	17-3023 Electrical & electronics engineering technicians	093400	Electronics and Electric Technology
	17-3025 Environmental engineering technicians	099900	Other Engineering & Related Industrial Tech
	17-3027 Mechanical engineering technicians	094500	Industrial Systems Technology and Maintenance
	17-3031.02 Mapping Technician	095730	Surveying
	47-2111 Electricians	095220	Electrical
	49-2096 Electronic equip. installers, repairers, motor veh.	094800	Automotive Technology
	49-3020 Automotive technicians and repairers	094800	Automotive Technology
	49-3031 Bus & truck mechanics & diesel engine specialists	094700	Diesel Technology
	51-2031 Engine and other machine assemblers	094720	Heavy Equipment Maintenance
	51-2041 Structural metal fabricators and fitters	095640	Sheet Metal and Structural Metal
	51-2092 Team assemblers	099900	Other Engineering & Related Industrial Tech
	51-4121 Welders, cutters, solderers, and brazers	095650	Welding Technology
	51-4122 Welding, soldering, and brazing machine	095650	Welding Technology

Crosswalk between Related Green Occupations and College Programs (TOP codes)

Green Economy area/sector	Green Occupations with SOC code*	Related TOP Code	TOP Program Title
Water, Wastewater & Waste Management	13-1041.01	Environmental compliance inspectors	039900 Environmental Sciences and Technologies, Other
	17-2081	Environmental engineers	099900 Other Engineering & Related Industrial Tech
	17-2141	Mechanical engineers	092400 Engineering Technology, General
	17-3025	Environmental engineering technicians	099900 Other Engineering & Related Industrial Tech
	17-3027	Mechanical engineering technicians	094500 Industrial Systems Technology and Maintenance
	19-1031	Conservation scientists	011400 Forestry
			011500 Natural Resources
			011520 Wildlife and Fisheries
	19-2041	Env. scientists and specialists, including health	039900 Environmental Sciences and Technologies, Other
	29-9011	Occupational health and safety specialists	095670 Industrial and Occupational Safety and Health
	43-5041	Meter readers, utilities	099900 Other Engineering & Related Industrial Tech
	47-2152	Plumbers, pipefitters, and steamfitters	095230 Plumbing, Pipefitting and Steamfitting
	47-3015	Helpers-pipelayers, plumbers, pipefitters...	095230 Plumbing, Pipefitting and Steamfitting
	47-4041	Hazardous materials removal workers	030300 Environmental Technology
	49-2092	Electric motor, power tool and related repairers	093400 Electronics and Electric Technology
	49-9012	Control and valve installers and repairers,	099900 Other Engineering & Related Industrial Tech
	49-9041	Industrial machinery mechanics (hydroelectric)	095630 Machining and Machine Tools
	49-9042	Maintenance and repair workers, general	095700 Civil and Construction Management Technology
	49-9043	Maintenance workers, machinery	095630 Machining and Machine Tools
	49-9098	Helpers-installation, maintenance, and repair	099900 Other Engineering & Related Industrial Tech
	51-4041	Machinists	095630 Machining and Machine Tools
	51-8021	Stationary engineers and boiler operators	099900 Other Engineering & Related Industrial Tech
	51-8031	Water and liquid waste treatment plant and	095800 Water and Wastewater Technology
51-9061	Inspectors, testers, sorters and weighers	095680 Industrial Quality Control	
53-7081	Refuse and recyclable material collectors	099900 Other Engineering & Related Industrial Tech	

Crosswalk between Related Green Occupations and College Programs (TOP codes)

Green Economy area/sector	Green Occupations with SOC code*	Related TOP Code	TOP Program Title
Environmental Compliance and Sustainability Planning	11-3071.01 Transportation managers	050100	Business and Commerce, General
		050500	Business Administration
		050600	Business Management
		051000	Logistics and Materials Transportation
		210200	Public Administration
		302000	Aviation and Airport Management and Services
		302010	Aviation and Airport Management
	13-1041.01 Environmental compliance inspectors	039900	Environmental Sciences and Technologies, Other
	15-2041 Statisticians	170100	Mathematics, General
	17-2081 Environmental engineers	099900	Other Engineering & Related Industrial Tech
	17-2111.01 Industrial safety and health engineers	099900	Other Engineering & Related Industrial Tech
	17-2151 Mining & geological engineers, incl. mining	099900	Other Engineering & Related Industrial Tech
	17-3025 Environmental engineering technicians	099900	Other Engineering & Related Industrial Tech
	19-1031.01 Soil and water conservatoinists	011400	Forestry
		011500	Natural Resources
		011520	Wildlife and Fisheries
	19-2041 Env. scientists and specialists, including health	039900	Environmental Sciences and Technologies, Other
	19-3011 Economists	220400	Economics
	19-3051 Urban and regional planner	099900	Other Engineering & Related Industrial Tech
	19-4021 Biological technicians	043000	Biotechnology and Biomedical Technology
	19-4031 Chemical technicians	095400	Chemical Technology
	19-4061.01 City and regional planning aides	099900	Other Engineering & Related Industrial Tech
	19-4091 Environmental science and protection technicians, including health	093470	Electron Microscopy
	192000	Ocean Technology	
19-4093 Forest and conservation technicians	011400	Forestry	
	011500	Natural Resources	
25-9021 Farm and home management advisors	010200	Animal Science	
	130580	Child Development Administration and Mgt	
	130110	Consumer Services	
	130100	Family and Consumer Sciences, General	
	130300	Fashion	

Crosswalk between Related Green Occupations and College Programs (TOP codes)

Green Economy area/sector	Green Occupations with SOC code*	Related TOP Code	TOP Program Title
Environmental Compliance and Sustainability Planning, continued		130570	Foster and Kinship Care
		130900	Gerontology
		139900	Other Family and Consumer Sciences
		130560	Parenting and Family Education
		010300	Plant Science
	29-9011 Occupational health and safety specialists	095670	Industrial and Occupational Safety and Health
	29-9012 Occupational health and safety technicians	095670	Industrial and Occupational Safety and Health
	53-6041 Traffic technicians	099900	Other Engineering & Related Industrial Tech

Educational Master Plan
Information Submission Form

1) Title: EDD- San Diego County Statistical Area

2) Author: Labor Market Information Division (Contact: Joe Briceno)

3) Source: EMPLOYMENT DEVELOPMENT DEPARTMENT

4) Taxonomy Area:

- Society
- Technology
- Economy
- Environment
- Politics and Legal Issues
- Education
- Other: _____

5) Relevance: Unemployment rates/trends/job growth

6) Page / Section: _____

7) Link to document: _____

or

8) Attach Document Here:

**SAN DIEGO-CARLSBAD-SAN MARCOS METROPOLITAN STATISTICAL AREA
(SAN DIEGO COUNTY)**
Employment up by 5,200 jobs over the month and up 19,200 jobs over the year

The unemployment rate in the San Diego County was 10.1 percent in February 2011, down from a revised 10.4 percent in January 2011, and below the year-ago estimate of 10.6 percent. This compares with an unadjusted unemployment rate of 12.3 percent for California and 9.5 percent for the nation during the same period.

Between January 2011 and February 2011, total nonfarm employment increased from 1,218,100 to 1,222,800, a gain of 4,700 jobs. Agricultural employment gained 500 jobs over the month, or 5.7 percent.

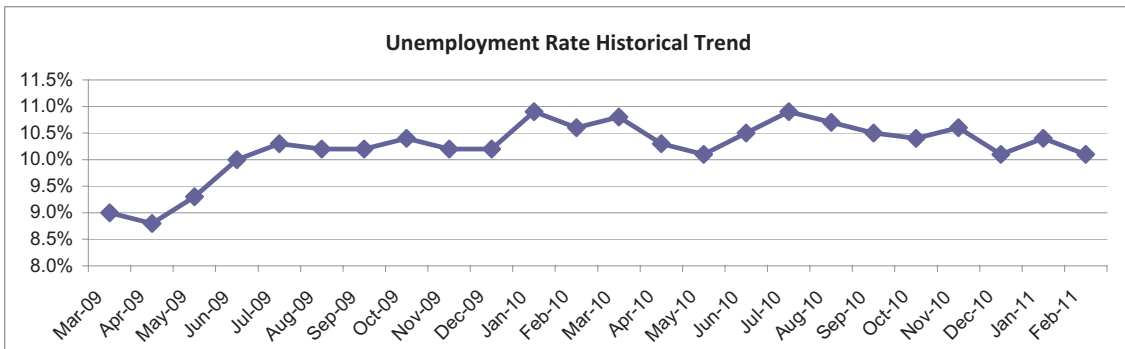
- Professional and business services reported the greatest month-over gain, adding 1,800 jobs. Job losses in administrative and support and waste services (down 700) offset employment growth in professional, scientific, and technical services (up 2,500). Management of companies and enterprises posted no change in employment levels over the month.
- Six other nonfarm industries also reported job growth, but the most notable came from leisure and hospitality (up 1,700), educational and health services (up 1,200), and government (up 900).
- Three sectors reported month-over job declines, including trade, transportation, and utilities (down 900), manufacturing (down 400), and construction (down 100). Mining and logging recorded no change in employment levels over the month.

Between February 2010 and February 2011, total nonfarm employment increased by 19,100 jobs, or 1.6 percent. Agricultural employment gained 100 jobs, or 1.1 percent.

- Professional and business services (up 10,700 jobs) posted the greatest year-over gain, primarily from professional, scientific, and technical services (up 6,100). Administrative and support and waste services increased by 4,200 jobs, followed by a gain of 400 jobs in management of companies and enterprises.
- Four other nonfarm sectors added jobs over the year, including leisure and hospitality (up 4,300), educational and health services (up 3,800), trade, transportation, and utilities (up 2,200) and government (up 1,900).
- Five other sectors reported year-over job declines, but the most notable came from construction (down 1,600 jobs).

IMMEDIATE RELEASE
 SAN DIEGO-CARLSBAD-SAN MARCOS METROPOLITAN STATISTICAL AREA (MSA)
 (San Diego County)

The unemployment rate in the San Diego County was 10.1 percent in February 2011, down from a revised 10.4 percent in January 2011, and below the year-ago estimate of 10.6 percent. This compares with an unadjusted unemployment rate of 12.3 percent for California and 9.5 percent for the nation during the same period.



Industry	Jan-2011	Feb-2011	Change		Feb-2010	Feb-2011	Change
	Revised	Prelim			Prelim		
Total, All Industries	1,226,800	1,232,000	5,200		1,212,800	1,232,000	19,200
Total Farm	8,700	9,200	500		9,100	9,200	100
Total Nonfarm	1,218,100	1,222,800	4,700		1,203,700	1,222,800	19,100
Mining and Logging	400	400	0		400	400	0
Construction	53,300	53,200	(100)		54,800	53,200	(1,600)
Manufacturing	92,200	91,800	(400)		92,100	91,800	(300)
Trade, Transportation & Utilities	197,100	196,200	(900)		194,000	196,200	2,200
Information	24,800	25,000	200		25,400	25,000	(400)
Financial Activities	66,500	66,600	100		67,200	66,600	(600)
Professional & Business Services	212,600	214,400	1,800		203,700	214,400	10,700
Educational & Health Services	148,600	149,800	1,200		146,000	149,800	3,800
Leisure & Hospitality	151,000	152,700	1,700		148,400	152,700	4,300
Other Services	45,000	45,200	200		46,100	45,200	(900)
Government	226,600	227,500	900		225,600	227,500	1,900

Notes: Data not adjusted for seasonality. Data may not add due to rounding
 Labor force data are revised month to month
 Additional data are available on line at www.labormarketinfo.edd.ca.gov

Data Not Seasonally Adjusted

	Feb 10	Dec 10	Jan 11 Revised	Feb 11 Prelim	Percent Change Month	Change Year
Civilian Labor Force (1)	1,556,000	1,555,200	1,558,600	1,553,600	-0.3%	-0.2%
Civilian Employment	1,390,300	1,397,600	1,397,200	1,396,900	0.0%	0.5%
Civilian Unemployment	165,700	157,600	161,400	156,700	-2.9%	-5.4%
Civilian Unemployment Rate	10.6%	10.1%	10.4%	10.1%		
(CA Unemployment Rate)	12.8%	12.3%	12.7%	12.3%		
(U.S. Unemployment Rate)	10.4%	9.1%	9.8%	9.5%		

Total, All Industries (2)	1,212,800	1,243,100	1,226,800	1,232,000	0.4%	1.6%
Total Farm	9,100	9,000	8,700	9,200	5.7%	1.1%
Total Nonfarm	1,203,700	1,234,100	1,218,100	1,222,800	0.4%	1.6%
Total Private	978,100	1,005,900	991,500	995,300	0.4%	1.8%
Goods Producing	147,300	146,200	145,900	145,400	-0.3%	-1.3%
Mining and Logging	400	400	400	400	0.0%	0.0%
Construction	54,800	54,300	53,300	53,200	-0.2%	-2.9%
Construction of Buildings	12,300	12,300	12,000	11,900	-0.8%	-3.3%
Heavy & Civil Engineering Construction	6,200	5,900	5,700	5,400	-5.3%	-12.9%
Specialty Trade Contractors	36,300	36,100	35,600	35,900	0.8%	-1.1%
Building Foundation & Exterior Contractors	6,300	6,300	6,100	6,200	1.6%	-1.6%
Building Equipment Contractors	15,100	15,200	15,100	15,200	0.7%	0.7%
Building Finishing Contractors	10,000	9,700	9,600	9,700	1.0%	-3.0%
Residual-Other Specialty Trade Contractors	4,900	4,900	4,800	4,800	0.0%	-2.0%
Manufacturing	92,100	91,500	92,200	91,800	-0.4%	-0.3%
Durable Goods	70,700	69,800	70,500	70,100	-0.6%	-0.8%
Computer & Electronic Product Manufacturing	26,400	24,900	25,100	25,100	0.0%	-4.9%
Transportation Equipment Manufacturing	13,800	13,700	13,800	13,700	-0.7%	-0.7%
Aerospace Product & Parts Manufacturing	5,600	5,800	5,800	5,800	0.0%	3.6%
Ship & Boat Building	7,100	6,800	6,900	6,800	-1.4%	-4.2%
Transportation EquipmentMfg -- Residual	1,100	1,100	1,100	1,100	0.0%	0.0%
Durable Goods - Residual	30,500	31,200	31,600	31,300	-0.9%	2.6%
Nondurable Goods	21,400	21,700	21,700	21,700	0.0%	1.4%
Service Providing	1,056,400	1,087,900	1,072,200	1,077,400	0.5%	2.0%
Private Service Producing	830,800	859,700	845,600	849,900	0.5%	2.3%
Trade, Transportation & Utilities	194,000	202,400	197,100	196,200	-0.5%	1.1%
Wholesale Trade	38,900	39,400	38,900	39,300	1.0%	1.0%
Merchant Wholesalers, Durable Goods	19,600	19,800	19,500	19,600	0.5%	0.0%
Merchant Wholesalers, Nondurable Goods	13,700	14,000	13,700	13,900	1.5%	1.5%
Wholesale Trade - Residual	5,600	5,600	5,700	5,800	1.8%	3.6%
Retail Trade	128,300	134,600	130,600	129,200	-1.1%	0.7%
Motor Vehicle & Parts Dealer	15,200	14,700	14,500	14,500	0.0%	-4.6%
Retail Trade - Residual	15,300	15,700	15,400	15,600	1.3%	2.0%
Building Material & Garden Equipment Stores	8,400	8,200	8,200	8,100	-1.2%	-3.6%
Food & Beverage Stores	26,800	27,200	27,000	27,000	0.0%	0.7%
Grocery Stores	23,600	24,000	23,900	23,900	0.0%	1.3%
Food and Beverage Stores - Residual	3,200	3,200	3,100	3,100	0.0%	-3.1%
Health & Personal Care Stores	8,000	7,900	7,800	7,700	-1.3%	-3.8%
Clothing & Clothing Accessories Stores	14,700	16,500	15,400	14,900	-3.2%	1.4%
Clothing Stores	11,600	13,200	12,200	11,700	-4.1%	0.9%
Residual-Shoe Stores	3,100	3,300	3,200	3,200	0.0%	3.2%
Sporting Goods, Hobby, Book & Music Stores	6,600	7,500	7,100	7,000	-1.4%	6.1%
General Merchandise Stores	25,500	29,000	27,400	26,600	-2.9%	4.3%
Department Stores	19,400	22,100	20,700	19,900	-3.9%	2.6%
Other General Merchandise Stores	6,100	6,900	6,700	6,700	0.0%	9.8%
Miscellaneous Store Retailers	7,800	7,900	7,800	7,800	0.0%	0.0%
Transportation, Warehousing & Utilities	26,800	28,400	27,600	27,700	0.4%	3.4%
Utilities	7,200	7,300	7,300	7,300	0.0%	1.4%
Transportation & Warehousing	19,600	21,100	20,300	20,400	0.5%	4.1%
Transportation and Warehousing - Residual	17,100	18,200	17,600	17,700	0.6%	3.5%

Data Not Seasonally Adjusted

	Feb 10	Dec 10	Jan 11 Revised	Feb 11 Prelim	Percent Change Month	Change Year
Warehousing & Storage	2,500	2,900	2,700	2,700	0.0%	8.0%
Information	25,400	24,900	24,800	25,000	0.8%	-1.6%
Publishing Industries (except Internet)	8,100	7,800	7,800	7,800	0.0%	-3.7%
Newspaper, Periodical, Book & Directory Publications	3,900	3,600	3,600	3,600	0.0%	-7.7%
Software Publishers	4,200	4,200	4,200	4,200	0.0%	0.0%
Broadcasting (except Internet)	4,400	4,200	4,200	4,200	0.0%	-4.5%
Telecommunications	8,300	8,200	8,200	8,300	1.2%	0.0%
Information - Residual	4,600	4,700	4,600	4,700	2.2%	2.2%
Financial Activities	67,200	67,200	66,500	66,600	0.2%	-0.9%
Finance & Insurance	41,800	41,700	41,200	41,200	0.0%	-1.4%
Finance and Insurance - Residual	900	1,000	800	800	0.0%	-11.1%
Credit Intermediation & Related Activities	18,900	18,700	18,600	18,600	0.0%	-1.6%
Securities, Commodity Contracts & Investment	7,300	7,300	7,300	7,300	0.0%	0.0%
Insurance Carriers & Related	14,700	14,700	14,500	14,500	0.0%	-1.4%
Real Estate & Rental & Leasing	25,400	25,500	25,300	25,400	0.4%	0.0%
Real Estate	20,500	20,600	20,500	20,600	0.5%	0.5%
Real Estate and Rental and Leasing - Residual	4,900	4,900	4,800	4,800	0.0%	-2.0%
Professional & Business Services	203,700	213,300	212,600	214,400	0.8%	5.3%
Professional, Scientific & Technical Services	116,100	119,500	119,700	122,200	2.1%	5.3%
Legal Services	12,100	12,200	12,000	12,100	0.8%	0.0%
Architectural, Engineering & Related Services	21,900	23,000	22,900	23,000	0.4%	5.0%
Scientific Research & Development Services	30,100	30,300	30,500	30,700	0.7%	2.0%
Professional, Scientific, and Technical Services - Residual	52,000	54,000	54,300	56,400	3.9%	8.5%
Management of Companies & Enterprises	16,600	17,000	17,000	17,000	0.0%	2.4%
Administrative & Support & Waste Services	71,000	76,800	75,900	75,200	-0.9%	5.9%
Administrative & Support Services	68,100	73,800	72,900	72,100	-1.1%	5.9%
Employment Services	25,800	29,300	28,900	28,000	-3.1%	8.5%
Services to Buildings & Dwellings	18,600	18,900	18,500	18,600	0.5%	0.0%
Administrative and Support Services - Residual	23,700	25,600	25,500	25,500	0.0%	7.6%
Waste Management & Remediation Services	2,900	3,000	3,000	3,100	3.3%	6.9%
Educational & Health Services	146,000	150,000	148,600	149,800	0.8%	2.6%
Educational Services	26,200	27,500	26,300	27,100	3.0%	3.4%
Colleges, Universities & Professional Schools	12,100	13,300	12,300	12,800	4.1%	5.8%
Educational Services - Residual	14,100	14,200	14,000	14,300	2.1%	1.4%
Health Care & Social Assistance	119,800	122,500	122,300	122,700	0.3%	2.4%
Ambulatory Health Care Services	52,300	54,200	53,900	53,900	0.0%	3.1%
Hospitals	25,400	25,500	25,800	25,900	0.4%	2.0%
Nursing & Residential Care Facilities	23,500	23,800	23,800	24,000	0.8%	2.1%
Social Assistance	18,600	19,000	18,800	18,900	0.5%	1.6%
Leisure & Hospitality	148,400	153,900	151,000	152,700	1.1%	2.9%
Arts, Entertainment & Recreation	21,900	23,600	23,000	23,400	1.7%	6.8%
Amusement, Gambling, & Recreation	14,800	15,700	15,300	15,500	1.3%	4.7%
Arts, Entertainment, and Recreation - Residual	7,100	7,900	7,700	7,900	2.6%	11.3%
Accommodation & Food Services	126,500	130,300	128,000	129,300	1.0%	2.2%
Accommodation	28,800	28,900	28,400	28,700	1.1%	-0.3%
Food Services & Drinking Places	97,700	101,400	99,600	100,600	1.0%	3.0%
Full-Service Restaurants	48,700	50,900	50,300	51,000	1.4%	4.7%
Food Services and Drinking Places - Residual	49,000	50,500	49,300	49,600	0.6%	1.2%
Other Services	46,100	48,000	45,000	45,200	0.4%	-2.0%
Repair & Maintenance	11,600	11,900	11,900	11,900	0.0%	2.6%
Personal & Laundry Services	14,600	15,500	15,100	15,000	-0.7%	2.7%
Religious, Grants, Civic, Professional & Like Organizations	19,900	20,600	18,000	18,300	1.7%	-8.0%
Government	225,600	228,200	226,600	227,500	0.4%	0.8%
Federal Government	45,400	46,300	46,100	46,000	-0.2%	1.3%
Federal Government excluding Department of Defense	24,400	24,100	24,100	24,000	-0.4%	-1.6%
Department of Defense	21,000	22,200	22,000	22,000	0.0%	4.8%
State & Local Government	180,200	181,900	180,500	181,500	0.6%	0.7%

March 25, 2011
 Employment Development Department
 Labor Market Information Division
 (916) 262-2162

San Diego Carlsbad San Marcos MSA
(San Diego County)
 Industry Employment & Labor Force
 March 2010 Benchmark

Data Not Seasonally Adjusted

	Feb 10	Dec 10	Jan 11 Revised	Feb 11 Prelim	Percent Change	
					Month	Year
State Government	42,600	43,400	43,600	43,600	0.0%	2.3%
State Government Education	28,300	28,900	29,100	29,100	0.0%	2.8%
State Government Excluding Education	14,300	14,500	14,500	14,500	0.0%	1.4%
Local Government	137,600	138,500	136,900	137,900	0.7%	0.2%
Local Government Education	74,100	75,600	74,500	75,800	1.7%	2.3%
County	19,400	19,300	19,200	19,000	-1.0%	-2.1%
City	17,900	17,900	17,700	17,700	0.0%	-1.1%
Special Districts plus Indian Tribes	26,200	25,700	25,500	25,400	-0.4%	-3.1%

Notes:

(1) Civilian labor force data are by place of residence; include self-employed individuals, unpaid family workers, household domestic workers, & workers on strike. Data may not add due to rounding. The unemployment rate is calculated using unrounded data.

(2) Industry employment is by place of work; excludes self-employed individuals, unpaid family workers, household domestic workers, & workers on strike. Data may not add due to rounding.

These data are produced by the Labor Market Information Division of the California Employment Development Department (EDD). Questions should be directed to: Joe Briceno 760/639-3760 or Ann Marshall 949/341-8051

These data, as well as other labor market data, are available via the Internet at <http://www.labormarketinfo.edd.ca.gov>. If you need assistance, please call (916) 262-2162.

#####

Educational Master Plan
Information Submission Form

1) Title: California unemployment insurance program broke and facing expensive default, auditor says

2) Author: Marc Lifsher

3) Source: LA Times- Business March 24, 2011

4) Taxonomy Area:

- Society
- Technology
- Economy
- Environment
- Politics and Legal Issues
- Education
- Other: _____

5) Relevance: Unemployment trends

6) Page / Section: money & Company

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California unemployment insurance program broke and facing expensive default, auditor says

March 24, 2011 | 10:51 am

(24) (3) Comments (2)

California employers could face a collective annual tax increase of up to \$6 billion if California's unemployment insurance program defaults on a loan from the federal government, the state auditor reported Thursday.

The unemployment insurance fund became insolvent in January 2009 and since then has been supported by a series of loans from the U.S. Department of Labor, the auditor said. The program, which is run by the California Employment Development Department, is expected to be \$13.4 billion in the hole by the end of this year unless the Legislature and governor agree to raise state payroll taxes.

By law, the state, which currently faces its own \$26-billion general budget deficit, must pay back the loans by November. Failure would trigger an initial tax hike of \$325 million next year.

The funding shortfall was caused by an unprecedented demand for benefits by Californians who lost their jobs in the worst economic downturn since the Great Depression. The number of initial claims for benefits received by the department grew 148% from July 2007 to June 2010, the auditor said. California's unemployment rate grew by 132% during the same period.

California's latest unemployment rate was 12.4% in January; February's number will be released on Friday.

"In the face of these challenges, the department has struggled to meet certain core performance measures," the audit said. As a result, the U.S. Labor Department in April officially classified the state as being "at risk" with regard to its ability to fulfill federal statutory requirements" for handling unemployment claims in a timely manner.

The state also faces the possible loss of \$839 million in federal stimulus money if it does not meet new requirements for calculating benefits by September 2012. That work has been hampered by the department's 30-year-old computer system, the Employment Development Department has said.

L.A. Times on Facebook

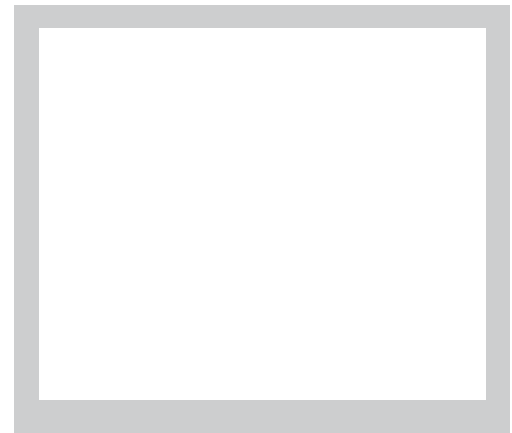
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The department's efforts to speed up claim processing by hiring more workers and having employees work more hours have been somewhat successful, the audit said. The number of processed claims rose from 173,000 in July 2007 to 429,000 last June.

However, "the results of the department's other efforts to improve its performance have been mixed," the audit said. The benefit of a change in a scheduling system designed to make timely nonmonetary decisions "appears negligible," the audit said.

Despite upgrades that increased telephone call volume sixfold, almost 90% of callers could not get through to an agent in fiscal year 2008-09, the audit said. That percentage remained high in the last fiscal year, based on figures through last May.

To fix the system, the auditor recommended that the department develop specific goals and milestones for speeding response time on claims. The phone system needs to be upgraded to limit the need for callers to speak to agents and ensure that they get needed information from automated responses.

The department's parent, the California Labor and Workforce Development Agency, has told the auditor it agrees with the findings and the recommendations for improvement and has already begun implementing them.

-- Marc Lifsher

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What is exactly is governments debt if all of States debts are included with the Federal debt. At this point if I could choose between my tax dollars funding more government or just being put into a blender, I would choose a blender, because at least it wouldn't do any harm.

Posted by: John Galt | March 24, 2011 at 01:07 PM

If anything raising taxes will not solve the problem according to LA times unemployment grew 138% thats a lot. How about creating jobs and let people work so they can spend that money to boost the economy ?? I dont know whats the deal there but that makes more sense than raising taxes,and lay off's.

Here is a hint every AMERICAN product made in china.

Posted by: Alibaba | March 24, 2011 at 04:44 PM

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Educational Master Plan
Information Submission Form

1) Title: Hard Hit Industry

2) Author: David Pittman

3) Source: Chemical & Engineering News (DECEMBER 6, 2010 VOLUME 88, NUMBER 49)

4) Taxonomy Area:

- Society
- Technology
- Economy
- Environment
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- Education
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5) Relevance: employment trends/external partnerships

6) Page / Section: _____

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CAREER & EMPLOYMENT



Home » December 6, 2010 Issue » Career & Employment » Changing Their Ways » Hard-Hit Industry

DECEMBER 6, 2010 | VOLUME 88, NUMBER 49 | WEB EXCLUSIVE

Hard-Hit Industry

Tough times in pharma provide opportunities for academe

David Pittman

Text Size [A](#) [A](#)

EMPLOYMENT STATUS	ALL RESPONDENTS		MEDICINAL/PHARMA SPECIALISTS	
	NUMBER	PERCENT	NUMBER	PERCENT
Full time	6,273	87.7%	657	86.6%
Part time	224	3.1	14	1.8
Postdoc	177	2.5	24	3.2
Not working but seeking employment	271	3.8	42	5.5
Not working and not seeking employment	68	1.0	13	1.7
Fully retired	136	1.9	9	1.2
TOTAL	7,149	100%	759	100%

SOURCE: 2009 ACS comprehensive salary and employment status survey of members

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Anyone who follows the pharmaceutical industry won't deny it has been hit hard by the recession, which started in 2007. C&EN estimated in early 2009 that almost 130,000 pharmaceutical industry workers had been laid off during the prior three years ([C&EN, March 16, 2009, page 24](#)). And the numbers have only grown worse since that time. Just last month, Roche announced it would eliminate 4,800 jobs in the next two years, and

AstraZeneca plans to cut 3,500 R&D jobs by 2014 ([C&EN, Nov. 22, page 6](#)).

In the wake of the recession, pharma workers are, in general, worse off than other chemistry fields. According to the 2009 American Chemical Society comprehensive salary and employment status survey of members, 5.5% of the chemists who identified their field as medicinal/pharmaceutical were unemployed. That's higher than the 3.9% unemployment rate for all chemists as a group ([C&EN, July 12, page 37](#)).

Although times have been rough for some industry workers, a few universities have capitalized when a pharmaceutical company leaves town. In Ann Arbor, Mich., where about 2,100 workers lost their jobs in 2007 and 2008 when Pfizer closed its sprawling campus there, the University of Michigan bought the complex and moved in last summer ([C&EN, Jan. 5, 2009, page 12](#)). The school now uses the site as incubator space for biotech start-ups and interdisciplinary research. Within a few years, the **North Campus Research Complex**, as the school calls it, hopes to bustle with 1,000 researchers, faculty, and staff and as many as five private companies.

As another example of universities taking advantage of the drug industry's decline, Yale University in 2007 bought a **136-acre campus in West Haven** and Orange, Conn., that was vacated by Bayer HealthCare ([C&EN, June 18, 2007, page 38](#)). The school has used the 1.6 million sq ft of research, office, and warehouse space to enhance Yale's medical and science research programs.

Other schools such as Vanderbilt University; Emory University; Temple University; and the University of California, San Francisco, have formed research partnerships with pharmaceutical companies.

Future growth in drug design will have to take place in academic settings, says UC Berkeley chemistry professor Michael A. Marletta. "I don't see a lot of possibilities within big pharma."

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Educational Master Plan
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1) Title: Workforce Snapshots

2) Author: _____

3) Source: www.cpec.ca.gov

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Workforce Snapshots - Jobs and Education in California

The Top 20 Highest Paying Jobs in California with a Bachelor's Degree

This table shows occupations in California for the degree level you selected. The minimum degree level is identified by the [Bureau of Labor Statistics](#) as the minimum degree level for a specific occupation. There are always exceptions. The Annual Growth is the PROJECTED number of new positions plus the number of replacement positions for the occupation in California. Note the annual growth rate for some of these occupations might be very low.

Click on the Occupation Code to visit our [School To Employment Pathways System \(STEPS\)](#). STEPS provides additional information about the occupation, types of degrees leading to that occupation, the number of degrees awarded in the most recent year, and more.

NOTE: Links to STEPS are not displayed for many occupations that do not require a degree.

The results only show part of the picture. Visit our [Postsecondary Education Value](#) page to explore another important reason to obtain a degree.

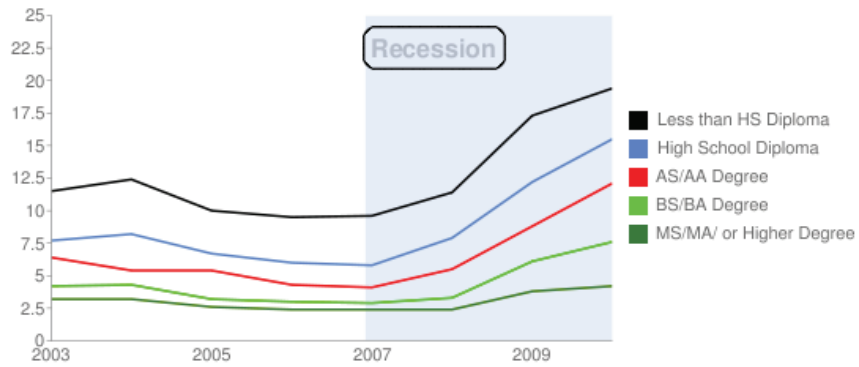
@ Any comments, questions, or suggestions are welcome; send to Data_Request@cpec.ca.gov or fill out the [Comments](#) form.

(Retrieving data...Done!)

Rank	Occupation Title	Annual Projected Openings	Minimum Degree Level	Annual Wage
1	General & Operations Managers STEPS	8,590	Bachelor's Degrees	\$119,461
2	Elementary School Teachers, Except Special Education STEPS	8,300	Bachelor's Degrees	\$60,349
3	All Other Business Operations & Human Resources Specialists STEPS	6,600	Bachelor's Degrees	\$63,802
4	Secondary School Teachers, Except Special & Vocational Education STEPS	5,550	Bachelor's Degrees	\$63,548
5	Accountants & Auditors STEPS	5,330	Bachelor's Degrees	\$68,786
6	Computer Software Engineers, Applications STEPS	4,750	Bachelor's Degrees	\$98,261
7	Teachers & Instructors, All Other STEPS	3,660	Bachelor's Degrees	\$47,377
8	Computer Software Engineers, Systems Software STEPS	2,850	Bachelor's Degrees	\$102,752
9	Management Analysts STEPS	2,490	Bachelor's Degrees	\$88,211
10	Property, Real Estate, & Community Association Managers STEPS	2,470	Bachelor's Degrees	\$47,731
11	Computer Systems Analysts STEPS	2,370	Bachelor's Degrees	\$81,166
12	Financial Managers STEPS	2,160	Bachelor's Degrees	\$118,179
13	Sales Managers STEPS	2,130	Bachelor's Degrees	\$117,112
14	Middle School Teachers, Except Special & Vocational Education STEPS	2,050	Bachelor's Degrees	\$62,369
15	Preschool Teachers, Except Special Education STEPS	1,810	Bachelor's Degrees	\$29,390
16	Chief Executives STEPS	1,790	Bachelor's Degrees	\$145,600
17	Recreation Workers STEPS	1,760	Bachelor's Degrees	\$25,166
18	Network Systems & Data Communications Analysts STEPS	1,720	Bachelor's Degrees	\$77,444
19	Computer & Information Systems Managers STEPS	1,610	Bachelor's Degrees	\$128,937
20	Network & Computer Systems Administrators STEPS	1,570	Bachelor's Degrees	\$78,336
Data Generated on Monday, March 28, 2011 at 9:05:25 AM				

Additional Considerations

The following chart shows unemployment rates by level of educational attainment. The lower the level of educational attainment the higher the level of unemployment, especially in difficult economic times. Rates in y-axis shown as percent unemployed.




Source of Unemployment Data: California Employment Development Department Labor Market Information <http://www.labormarketinfo.edd.ca.gov/>.

Source of Median Income Data: U.S. Census Bureau American FactFinder http://factfinder.census.gov/home/saff/main.html?_lang=en.

Note: Data from non-census years are estimates based on surveys.

Please see the U. S. Census Bureau website for more detailed information.

This is just a glimpse of the data available from the Commission.

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Workforce Snapshots - Jobs and Education in California

The Top 20 Highest Paying Jobs in California with an Associate Degree

This table shows occupations in California for the degree level you selected. The minimum degree level is identified by the [Bureau of Labor Statistics](#) as the minimum degree level for a specific occupation. There are always exceptions. The Annual Growth is the PROJECTED number of new positions plus the number of replacement positions for the occupation in California. Note the annual growth rate for some of these occupations might be very low.

Click on the Occupation Code to visit our [School To Employment Pathways System \(STEPS\)](#). STEPS provides additional information about the occupation, types of degrees leading to that occupation, the number of degrees awarded in the most recent year, and more.

NOTE: Links to STEPS are not displayed for many occupations that do not require a degree.

The results only show part of the picture. Visit our [Postsecondary Education Value](#) page to explore another important reason to obtain a degree.

Any comments, questions, or suggestions are welcome; send to Data_Request@cpec.ca.gov or fill out the [Comments](#) form.

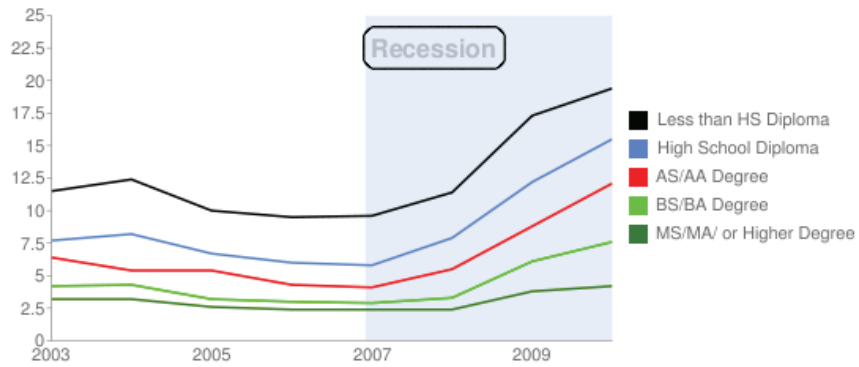
(Retrieving data...Done!)

Rank	Occupation Title	Annual Projected Openings	Minimum Degree Level	Annual Wage
1	Registered Nurses STEPS	10,910	Associate Degrees	\$80,551
2	Computer Support Specialists STEPS	2,210	Associate Degrees	\$51,663
3	Electrical & Electronic Engineering Technicians STEPS	1,010	Associate Degrees	\$58,893
4	Dental Hygienists STEPS	1,000	Associate Degrees	\$83,812
5	Computer Specialists, All Other STEPS	980	Associate Degrees	\$78,397
6	Paralegals & Legal Assistants STEPS	940	Associate Degrees	\$55,960
7	Respiratory Therapists STEPS	590	Associate Degrees	\$63,384
8	Radiologic Technologists & Technicians STEPS	580	Associate Degrees	\$60,585
9	Medical Records & Health Information Technicians STEPS	560	Associate Degrees	\$36,056
10	Medical & Clinical Laboratory Technicians STEPS	450	Associate Degrees	\$40,270
11	Engineering Technicians, Except Drafters, All Other STEPS	420	Associate Degrees	\$57,611
12	Biological Technicians STEPS	360	Associate Degrees	\$45,223
13	Life, Physical, & Social Science Technicians, All Other STEPS	320	Associate Degrees	\$44,013
14	Civil Engineering Technicians STEPS	300	Associate Degrees	\$57,857
15	Semiconductor Processors STEPS	300	Associate Degrees	\$40,008
16	Veterinary Technologists & Technicians STEPS	290	Associate Degrees	\$34,148
17	Industrial Engineering Technicians STEPS	270	Associate Degrees	\$57,539
18	Physical Therapist Assistants STEPS	220	Associate Degrees	\$54,975
19	Mechanical Engineering Technicians STEPS	200	Associate Degrees	\$54,535
20	Chemical Technicians STEPS	190	Associate Degrees	\$43,982

Data Generated on Monday, March 28, 2011 at 9:04:10 AM

Additional Considerations

The following chart shows unemployment rates by level of educational attainment. The lower the level of educational attainment the higher the level of unemployment, especially in difficult economic times. Rates in y-axis shown as percent unemployed.




Source of Unemployment Data: California Employment Development Department Labor Market Information <http://www.labormarketinfo.edd.ca.gov/>.

Source of Median Income Data: U.S. Census Bureau American FactFinder http://factfinder.census.gov/home/saff/main.html?_lang=en.

Note: Data from non-census years are estimates based on surveys.

Please see the U. S. Census Bureau website for more detailed information.

This is just a glimpse of the data available from the Commission.

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1) Title: 10 jobs of the future

2) Author: Rachel Farrell

3) Source: www.msn.careerbuilders.com

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10 jobs of the future

By Rachel Farrell, Special to CareerBuilder



We know where the jobs are today -- and we definitely know where they aren't. But what about in 10 or even 20 years?

As things like technology, medicine, science and environmentalism continue to advance in the coming years, several occupations are bound to emerge. By understanding these trends, job seekers can play a more active role in planning for their careers.

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Some are speculative, some are definitive -- but here are 10 potential jobs of the near or distant future, based on the trends:

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1. Cyber security specialist

Cyber security is a growing industry. Knowledgeable professionals who can protect websites and expose hackers will be a hot commodity in the coming years.

2. Genetic counselor

Genetics are advancing at a rapid rate. Doctors can now run tests that will predict genetic conditions, and soon, parents may be able to choose the sex of their unborn children. With the help of genetic counselors, families can educate themselves on available genetic technologies and options.

3. Organic food farmer

Organic food currently occupies about 10 percent of the food and beverage market -- and it's only going to increase. As a result, more organic farmers and producers will need to improve organic farming techniques and grow the food.

4. Medical records administrator

Medical records are at the forefront of innovative technology, with a strong push to digitize medical records. An increased number of medical researchers will be needed to help transition records from paper to digital, and to be able to navigate records quickly for patients.

5. Mobile application developer

Remember car phones? You know, the equivalent of a cell phone, except that you could only use it in the car and it was the size of a brick? With the development of phones like the BlackBerry, Android and iPhone, the mobile media industry is continually progressing. An increased number of developers will be needed to help develop applications, in addition to combating security and compatibility issues.

6. Robotics technician

Robots are becoming more commonplace and they don't run on their own. Technicians will be needed to build robots, maintain them and keep them from malfunctioning.

7. Simulation engineer

There's a simulator for nearly everything these days, from surgeries to flying to drinking and driving. As more simulation-based technologies follow suit, engineers will be required to help out.

8. Social media manager

Social media is the new "it" profession. It started with Facebook, Twitter and LinkedIn and has expanded to many other platforms. Organizations are now employing social media managers to oversee their online communities and enhance/protect the company brand.

9. Stem cell researcher

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Although it's a controversial topic, stem cell research is gaining ground. If this continues, more researchers will be needed to develop cures for diseases, genetic enhancements, and the other information these cells may potentially hold.

10. Sustainability officer

Sustainability has become a concern around the world and also among businesses. Since the executive suite may not have time to learn all there is to know, organizations are hiring eco-savvy individuals as "sustainability officers." These folks will find, research, and implement eco-friendly policies to benefit the organization.

[Bing: Jobs with great growth potential](#)

Rachel Farrell researches and writes about job search strategy, career management, hiring trends and workplace issues for CareerBuilder.com. Follow @CareerBuilder on Twitter.

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1) Title: ECONOMY: Job picture boosted by professional and education jobs

2) Author: Pat Maio

3) Source: North County Times (Friday, March 25, 2011)

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ECONOMY: Job picture boosted by professional and education jobs

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By PAT MAIO - pmaio@nctimes.com | Posted: Friday, March 25, 2011 2:36 pm | No Comments
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SAN DIEGO ---- Unemployment fell slightly in February as professional jobs showed noticeable gains in San Diego County and educational and health positions saw highs in Riverside County, according to data released Friday by the state's Employment Development Department.

San Diego County's unadjusted unemployment rate fell to 10.1 percent in February, down from a revised 10.4 percent in January, and below the year-ago estimate of 10.6 percent, according to the EDD. The county's unemployment rate also is below the January 2010 estimate of 10.9 percent when the market's unemployment rate hovered at its highest in more than two decades, when local record-keeping began.

In the Inland Empire ---- which includes Riverside and San Bernardino counties ---- unemployment fell to 13.9 percent in February, down from a revised 14.2 percent in January, and below the year-ago estimate of 14.6 percent.

Christa Shapiro, senior vice president in Carlsbad for Adecco, one of the largest employment agencies in the area, said she's seeing an upswing in requirements by local businesses in San Diego to hire administrative support assistants ---- a job category classified as a professional.

"Typically, the last skill set to be hired back are support level people," said Shapiro, who added that she is currently trying to fill at least two dozen openings for administrative assistants, higher level marketing and sales positions, and manufacturing jobs.

"I'm also seeing some companies bring back their calls centers from Mexico," Shapiro said.

The employment gains throughout region brought a sigh of relief as jobs disappeared in January for temporary holiday workers, even while new worries have begun in the past month over inflation due to rising fuel costs. The fallout effects from the recent Japan earthquake, and the Libyan crisis that has temporarily halted crude oil production from that nation, also have emerged as concerns.

"For the first two months of the year, we've added almost 6,000 jobs locally, which is well on the way for achieving our forecast of 18,000 for the year. We've seen some setback with oil prices (rising to nearly \$4 per gallon at the pump), but it does appear that companies are hiring again," said Lynn Reaser, chief economist for Point Loma Nazarene University.

Shapiro said some medical device makers involved in surgical tools in San Diego County are beginning to worry about widget supplies as a result of the stalled Japanese economy.

"Production managers are worried about this," she said.

In San Diego County, employment was up by 5,200 jobs over the month and about 19,200 jobs over the year. The greatest month-over-month gain came in the professional and business services category, where 1,800 jobs were created. Another notable category for job gains came from the leisure and hospitality sector, which saw 1,700 additional jobs, according to the EDD.

In the Inland Empire, in January and February, the biggest jobs-gainer was in the area of educational



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and health services, which added 2,300 jobs, according to EDD.

Riverside County's preliminary unemployment rate was 14.1 percent in February, down from 14.3 percent in January. The unemployment rate had been locked at 15.3 percent in the July-to-September period.

Evelyn Wilcox, spokeswoman for temporary employment agency Manpower Inc., for the Inland Empire region, has difficulty seeing solid trends developing for the local jobs scene.

"It's all over the map. It's one thing one week and another the next. It's kind of unpredictable," Wilcox said.

"The jobs picture has been lagging for the last couple of years here. There has been some movement, but it just isn't booming," said Wilcox, who confirmed that more temporary jobs are getting filled in local schools for cafeteria and other nonteaching positions.

The jobs picture also improved slightly in Southwest Riverside County.

The cities of Murrieta and Temecula had unemployment rates of 9.4 percent and 9.7 percent in February, respectively, according to the EDD. Murrieta's jobless rate fell slightly from 9.5 percent in January, while Temecula's fell from 9.8 percent.

Statewide, the unadjusted unemployment rate was 12.3 percent while the country saw a 9.5 percent rate in February.

Overall, U.S. companies have added jobs for 12 straight months. California and Michigan, which each suffered some of the worst job losses during the recession, are adding jobs again. California last month had its single best month for job creation in more than two decades.

Sacramento-based EDD economist Paul Wessen said it's too early to break out the champagne on jobs statewide. California saw about 196,400 new jobs in February, and a total of 208,000 over the past five months, he said.

"It looks like the economy might be generating some sort of momentum," Wessen said. "If you get another month of growth like that, then you can start celebrating. The story is still to be told."

Call staff writer Pat Maio at 760-740-3527.

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1) Title: Study Reveals How the Economic Downturn is Affecting College Choice

2) Author: Stern, Gary

3) Source: The Hispanic Outlook on Higher Education (Feb. 7, 2011)

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Study Reveals How the Economic Downturn Is Affecting College Choice

Article from: **The Hispanic Outlook in Higher Education** Article date: **February 7, 2011** Author: **Stern, Gary M**

Some students choose a college based on academics, career aspirations, the institution's reputation, quality of faculty, location, student body and athletic facilities. But the 2010 College Decision Impact Survey financed by Fast Web, a scholarship-matching engine owned by Monster Worldwide and Maguire Associates, an education consulting firm based in Concord, Mass., reveals that money is an increasingly important factor impacting college choice. Indeed, two-thirds of the 800 students surveyed online, about a third of whom are minority, said that family economics influenced their college selection.

Mark Kantrowitz, publisher of Fastweb.com and FinAid.org and author of a book due out this fall, *Secrets to Winning a Scholarship*, says that economic factors are playing an increasingly prominent role in determining which college students attend. "If they can't afford die school, they won't go - no matter how good the school is," he stated.

Because many Latino students are the first generation in their family to apply to college, their parents can't offer much help with completing complicated financial aid forms and college applications, explained Alejandra Rincón, vice president of programs at the Híspame Scholarship Fund (HSF) based in San Francisco, Calif. Indeed many Latino students are surprised to learn that they can apply for FAFSA (Free Application for Federal Student Aid), compete for grants and scholarships and don't have to take out loans to finance their entire college education.

When affordability impacts college choice, graduation rates decline, Kantrowitz said. More students are gravitating to community colleges because they're less expensive than four-year colleges. Students who begin higher education in community college earn a bachelor's degree at a rate 14.5 percent less than students who begin in four-year colleges. American higher education "is moving in the wrong direction. We should be increasing the number of bachelor's degrees, not decreasing them," he said.

Because community colleges are cost effective and money is playing a greater role, Rincón noted that about two-thirds of Latinos begin higher education at junior colleges. Though most two-year colleges offer remedial education, liberal arts courses and increasingly specialized and technical programs, Rincón said that most students who start there fail to earn an associate degree or a bachelor's degree. She urges students to make sure to take credit-bearing classes that will transfer to a four-year college.

Despite the economic recession, most students have not opted to take a year or two off, save money and then attend college, the survey noted. Both Kantrowitz and Rincón say that starting college immediately is the best route to take. "Data show that students who delay don't return to college. They start earning money and think they don't have to earn an associate degree. They don't think long-term," explained Rincón. Kantrowitz adds that students who take a year off get out of the habit of studying and can lose their academic drive.

Moreover, lower-income and minority students are opting in greater numbers to attend state colleges to trim costs. The survey revealed that 71 percent of Latino students were pursuing state colleges, and 62 percent of Caucasians.

But state college fees are rising. Kantrowitz warns that many state colleges, which have been a major destination for many minorities, are increasing tuition and other fees due to state budgetary woes. Tuition is rising at double-digit increases, including state colleges in California, where tuition will spike 32 percent; Florida, 15 percent; and Arizona, about 10 percent. In a recession, state income tax revenue decreases, higher education budgets are cut, and the only discretionary item left is raising tuition.

Even before the financial crisis, many Latino students were living at home and attending college in proximity to where they reside. Rincón notes that frequently private colleges located far from home are the schools that offer the most scholarships and financial aid, which can make college more affordable than staying close to home.

Having fewer Latino and minority students attend private colleges is contributing to lowering minority graduation rates, Kantrowitz asserted. Private colleges have higher graduation rates because they often have smaller student-faculty ratios and provide more counseling and supportive services than larger public and state colleges. One reason why private colleges are more expensive, he says, is the cost of additional faculty, facilities and services offered. Kantrowitz added that private colleges are wooing lower-income students by increasing the number of need-based financial aid scholarships.

Understanding the Net Cost of a College Education

Students are increasingly paying attention to the net cost of a college education. Kantrowitz defines net cost as the actual price of tuition, room and board, and books after subtracting money derived from grants and scholarships. If the college costs \$20,000 annually, including room, board and books, and a student received \$8,000 in need-based aid from the college, \$4,000 from Pell Grants and \$1,000 in an additional scholarship, the net cost would be \$7,000, which the family or student would need to provide from savings or by taking out loans.

Recognizing that lower-income students are being closed out of private colleges by rising college costs, 6,000 colleges have adopted no-loan financial aid, replacing loans with college-financed grants. But Kantrowitz said that this approach has not resulted in attracting more low-income and working-class students. Since colleges haven't established specified admission policies for lower-income students, the number of students applying for these loans has risen dramatically and more middle-class students are earning them, not low-income students. The only way to boost the number of minority students would be to develop criteria that offer certain advantages to lower-income students.

Because of rising college costs, more students are applying for need-based financial aid. Some colleges offer aid primarily to the neediest students while others spread their financial aid among all students who meet the criteria.

For-profit colleges such as the University of Phoenix are showing an increase in minority enrollment because these schools are affordable, have open admissions policies and help students gain federal loans. Some for-profit colleges have been criticized, however, for accepting students who aren't equipped to repay their college loan. "It's not clear whether for-profit colleges are serving the underserved population or exploiting it," Kantrowitz said.

Because of the economic slowdown, a greater number of students are applying to the Hispanic Scholarship Fund (HSF) for financial aid. Of HSF's total funding, \$21 million stems from the Gates Millennium Scholars program. Eligible students are Latino residents or citizens with a 3.3 GPA who meet federal income guidelines. The average scholarship offers \$12,000 a year and covers undergraduate education, but also finances master's and doctoral programs in the following disciplines - science, math, engineering, computer science education, library science, public health. The other HSF scholarships provide \$7 million in funding for Latino residents or citizens with a 3.0 GPA, based on their writing three essays and attending an accredited university. Last year, 3,000 scholarships were awarded, averaging \$2,500 a year.

What are Kantrowitz's best tips for minority students who want to be accepted into the college of their choice?

- 1) Submit the free application for federal student aid. Last year, 2.3 million students who would have qualified for Pell Grants didn't apply.
- 2) If you need to borrow money for college, look for federal loans first. They are less expensive than bank loans.
- 3) Consider joining AmeriCorps, which provides \$5,500 maximum (same as Pell Grants) in scholarship money annually for volunteers.
- 4) Apply for the Hope Scholarship Tax Credit, which provides up to \$2,500 in tax credit based on a percentage of tuition and fees, of which \$1,000 is refundable.
- 5) Start saving \$100 a month for 10 years at 6 percent or more interest, and that will ease the need to borrow.

Financial aid websites can help students obtain the \$3.5 billion in scholarship money that was awarded in 2009. Students who use Fastweb.com, for example, fill out a questionnaire, which takes about a half-hour to complete. Based on a student's data, the site recommends the best scholarships to apply for. Because of the recession, scholarship money is more competitive than ever, but students who don't apply are "leaving money on the table," Kantrowitz said.

HSF's Rincón offers six tips for Latino students interested in applying to college:

- 1) Start early, during freshman or sophomore years, to research colleges and financial aid. Do not wait until senior year when the deadlines approach, which is far too late.
- 2) Challenge yourself academically in high school, which increases your chances of gaining college acceptance. Take algebra, advanced math and Advanced Placement (AP) classes.
- 3) Apply to at least four colleges, including one state and one private, and see how much scholarship money the private college offers.
- 4) If you need to take out loans, keep them to a minimum. Some students take out

excessive loans, beyond what college costs are, and end up having to pay too much money back.

5) Reach out to the Hispanic College Fund, MALDEF and Tomás Rivera Policy Institute, which has listings of scholarships offered to Latinos.

6) Even after gaining acceptance to college and starting as a freshman, continue to apply for scholarships. Scholarships are awarded to students in college as sophomores and juniors, so the persistent students gain the financial aid.

Choosing the best college for the right price depends on how much a family needs to borrow. Kantrowitz considers borrowing \$10,000 a year as the maximum. "If you need to borrow more than that, consider another college," he said. Strapping a graduating student with \$40,000 to \$50,000 or more over four years in college debts requires many students to repay the loan over 30 years, which means considerable extra interest.

Mark C. Taylor, author of *Crisis on Campus: A Bold Plan for Reforming Our Colleges and Universities*, noted in a New York Times Op-Ed piece that, if recent trends continue, the price of a four-year education at a top-tier college will spike to \$330,000 in 2020. He noted that "financial aid is drying up and government support is not keeping pace with the rising cost of college; students and parents are being forced to borrow more heavily." Kantrowitz said college costs are rising at about 6 percent to 8 percent a year, but Pell Grants have not risen appreciably in the last few years.

Economic concerns should not prevent Latino or other students from attending college, Rincón suggested. Colleges "open up so many opportunities in life. You'll make more money, but it also affords first-generation Latinos the life their parents dreamed of for them. It enriches your life, and you'll lead a better life for it," she said.

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1) Title: How to Hire Best Auto Techs

2) Author: Greg Dickson

3) Source: WARD'S Dealer Business (dec. 2010)

4) Taxonomy Area:

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5) Relevance: employment trends

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How to Hire Best Auto Techs

Lots of job seekers can actually hinder the hiring process

By Greg Dickson

In a tough economy with record unemployment, it's a common misperception that employers have an easier time finding highly qualified staffers.

But a surplus of available workers can actually complicate the hiring process. That's because employers must weed through lots of resumes and applications to find the right candidate.

So, it's important for employers to understand and quickly identify the key success factors for recruiting, hiring and retaining the best auto technicians.

From auto maker-specific training to professional conduct standards, there are important attributes dealers should consider when hiring new technicians.

Technical schools are a great resource for qualified talent.

For instance, Universal Technical Institute has been training technicians for 45 years. We've worked with top dealers to help place top candidates with manufacturer-specific and manufacturer-approved advanced training.

Dealers who post job openings with a technical school can reach a highly motivated group of graduates who have already invested 12 to 18 months in an automotive-training program.

In addition, technical schools can reduce a dealer's hiring overhead by providing access to a staff that can recommend high-caliber students and graduates for job openings.

Some technical schools also host job fairs and employment days to bring dealers together with qualified entry-level technician candidates to fill employment opportunities.

Dealers end up determining that graduates with proper training can make an immediate impact and a great addition to



Dealers end up determining that graduates with proper training can make an immediate impact and a great addition to their team.

their team.

Technical schools, particularly those focused on the automotive, diesel, and collision repair fields, operate in facilities that meet industry standards and graduate highly skilled entry-level technicians.

Graduates earning a technical degree from a school offering a reputable core automotive program will have extensive hands-on experience diagnosing and repairing domestic and foreign vehicles.

These students are taught how to troubleshoot using the latest equipment under the guidance of experienced instructors. They have mastered a curriculum based on the latest industry technology and procedures that is balanced with theory, diagnosis, demonstration and garage work.

In addition to the technical training, students at top automotive schools learn essential workplace skills with a focus on customer service and professionalism.

The quality of a candidate's technical education background can be reaffirmed by nationally recognized industry standards.

The National Automotive Technicians Education Foundation examines the structure and resources of training programs against national quality standards that students must master.

Automotive Service Excellence (ASE) certification through NATEF ensures that students graduate from a certified training

program that will meet or exceed industry-recognized standards of excellence.

Select automotive training schools have partnerships with original equipment manufacturers and have developed training specific to those manufacturers.

Graduates of basic automotive programs can qualify and elect to complete this specialized training. By completing these programs, these technicians are also able to understand and maintain OEM specifications.

Conversely, to fully certify an entry-level technician with no prior factory credential training is a long process. It can take a dealer up to five years or more to assist the technician in attaining such credentials.

With more candidates in the work pool, dealers will have to sift through many more applicants to find the right talent for their organization.

To get the best, it is not only important to know what skills and experience to look for, but also where to find the best-trained candidates. Recruiting from technical schools is a great place to start. ■

Greg Dickson is a senior vice president at Phoenix, AZ-based Universal Technical Institute that educates students preparing for careers as vehicle technicians. He can be reached at gdickson@uti.edu.

Educational Master Plan
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1) Title: Green Roofs mean Green Jobs

2) Author: Michael Krause, Peter Lowitt, AICP, and Steven Peck

3) Source: Planning April 2010

4) Taxonomy Area:

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GREEN

Roofs Mean

Jobs



By Michael Krause, Peter Lowitt, AICP, and Steven Peck

Accelerating public and private investment in green infrastructure, particularly green roofs and walls, urban forests, community gardens, and bioswales, has tremendous potential to reduce infrastructure costs, cool urban areas, and improve the health and well-being of our cities. Just as important, green infrastructure investments can create jobs.

In February 2009, Green Roofs for Healthy Cities—a Toronto-based nonprofit industry association—worked with the American Society of Landscape Architects and the staff of U.S. Sen. Ma-

ria Cantwell (D-Wash.) to introduce a 30 percent tax incentive meant to spur investment in green roofs. Meanwhile, Congress and the Obama administration are considering what steps to take next to create more jobs.

It seems obvious that green infrastructure has the potential for significant returns on investment. A recent study, "Creating Jobs and Stimulating the Economy Through Investment in Green Water Infrastructure," undertaken by American Rivers and the Alliance for Water Efficiency, estimates that putting green roofs

on just one percent of the large buildings in cities with over 50,000 people, a total of 48.5 billion square feet of roof area, would foster more than 190,000 jobs and provide billions in revenue to suppliers and manufacturers that make, grow, and distribute green-roof-related materials.

To make its projections, American Rivers extrapolated from a study done for Washington, D.C., that estimated that 5,895 jobs would result from a \$300 million investment in 15 million square feet of green roofs in the city. Officials there pegged the costs for building a

The potential
is there for
creating
new types of
employment.



Courtesy Green Roofs for Healthy Cities

Toronto-based Green Roofs for Healthy Cities gave its 2009 award for green wall design to Green Living Technologies. The project: The Urban Farming Food Chain.

typical green roof at \$20 per square foot and assumed that at least one permanent job would be directly created for every \$508,906 of investment—with additional employment resulting from ongoing maintenance and manufacturing and distribution of green roof materials.

Based on its own analysis of 22 recent green roof projects, Green Roofs for Healthy Cities found that for each \$1 million spent, 2.8 full-time local jobs were created—\$357,142 for each job—without counting the additional employment impact of ongoing maintenance

Defining green jobs

When it comes to job creation, green is the color of the moment. From 1998 to 2007, clean energy jobs expanded nationally two and a half times faster than overall jobs, and the field is growing faster than any other sector, increasing by 9.1 percent annually, according to a 2009 report by the Pew Charitable Trust. Some 750,000 Americans work in what can be called green jobs, and billions of dollars in federal stimulus funding may help to sustain this trend despite a slow economy.

For an architect, a green job may involve designing projects that enhance the environment. For an electrician, it may mean doing energy audits or installing solar energy systems. For an industrial worker, it may involve producing wind-turbine blades or batteries for electric vehicles.

A green planning job could involve any number of specialties—from natural resource management to environmental planning. Anyone working on sustainability plans or climate action plans would be part of this group as well.

The 2009 Michigan Green Jobs Report defines green jobs as “directly involved in generating or supporting a firm’s green-related products or services.” Michigan’s green economy includes industries that provide products or services in agriculture and natural resource conservation, clean transportation and fuels, increased energy efficiency, pollution prevention or environmental cleanup, and renewable energy production.

The definition of and criteria for green jobs vary, however, and some believe they should include a quality standard. “We are not looking to create lousy green jobs,” says Cassandra Moseley of the University of Oregon’s Ecosystem Workforce Program. “Job quality needs to be a central component of a green jobs definition: a safe work place, durability, a career path, and a family wage.”

Close up views

Moseley notes that big declines in the wood products industry, housing construction, and motorcoach manufacturing have pushed Oregon to one of the nation’s highest unemployment rates. And, she adds, “when the companies shut their doors, the wealth left the communities as well.” Some rural communities are trying to replace those lost jobs with green jobs, but success has been modest, she says, partly because small communities don’t have the resources to compete for federal stimulus funds.

Can the local food movement help out? Possibly, says Charles Connerly, director of the University of Iowa’s graduate program in urban and regional planning—and president-elect of the American Collegiate Schools of Planning. “There are more opportunities for local farmers to grow and make money when there is a market for their food, especially if you have restaurants buying their produce.”

Joan Fitzgerald, the director of the Law, Policy and Society Program at Northeastern University in Boston, is skeptical about the prospects for green jobs, even in what others consider promising industries. Fitzgerald, the author of *Emerald Cities: Urban Sustainability and Economic Development*, scheduled for publication this spring, points out that 70 to 75 percent of the world’s solar and wind energy jobs are in manufacturing, but that most of solar panels and wind turbines are made outside the U.S.

“Rather than being the innovators,” she says, “we are the consumers of the technologies of the future.”

Sarah Lozanova

Lozanova is a freelance writer based in Wisconsin.

OSU College of Forestry



The Ecosystem Workforce Program ranks workforce assessment as step one in creating quality ecosystem jobs. Here: a tree-planter.

or the materials, almost all of which are manufactured in the U.S.

Taking into account a 30 percent credit for green roofs, GRHC estimates the cost in federal tax dollars for each job created at \$107,143, which compares very favorably with other job creation strategies. The group's new Green Roof Professional designation certifies qualified individuals who can turn green roof projects around rapidly, particularly retrofit projects.

The math is favorable for green roofs. Assuming that the cost difference between an extensive green roof and a conventional roof is \$25 per square foot, a 30 percent federal tax credit (budgeted at \$1.5 billion) would leverage 200 million square feet of green roof area annually. Aiming at two billion square feet or \$50 billion in green roof projects over five years, 140,000 jobs might result.

Green roof investment could have a number of other benefits if the goal is to create jobs quickly:

- Green roofs are more labor intensive than traditional infrastructure projects, with about 45 percent of each dollar spent on labor.
- When undertaken as retrofits, green roofs can be completed in less than a year.
- Green roofs and other forms of green infrastructure can create ongoing maintenance jobs.
- Green roofs and walls can be built by both public and private entities.
- Green infrastructure for stormwater management, energy efficiency, and urban heat island reduction can keep a lid on initial capital costs and lifecycle costs.

Government can help

"Grey to Green," a 2009 study prepared for the Climate Change Conference in Copenhagen and compiled by Pricewaterhouse Coopers for the United Kingdom's Commission for Architecture and the Built Environment (www.cabe.org.uk), found that shifting just one-half of one percent of infrastructure funding from gray to green in four English jurisdictions would yield a 141 percent increase in the level of green-related infrastructure investment there.

Some U.S. cities are thinking more expansively about the potential for these multiple benefits. Philadelphia recently completed a



Landworks Studio's Macallen Building Condominiums project received the 2009 Green Roofs for Healthy Cities award in the category of Intensive Residential.

\$1.6 billion plan, Green Cities—Clean Water, aimed at transforming the city over the next 20 years by managing stormwater using green infrastructure instead of just sending it streaming into sewers and rivers. (See News, November 2009.)

The city's water department expects to invest roughly \$1.6 billion on implementation, which has already begun. According to the plan, the green method will result in \$2 in benefits for each \$1 invested by the city.

New York, Chicago, and Washington all offer financial incentives to building owners to install green roofs on existing buildings. In February, Toronto became the first major city in North America to require green roofs on all new buildings, ranging from 20 to 60 percent of the available roof area. These measures are expected to stimulate related jobs in design, manufacturing, installation, and maintenance.

But the major impetus for green infrastructure needs to come from the federal

government. There are several federal options:

- Green roofs could be included in the Energy Star program. This could be considered an equivalent to reflective "cool roofs," which already receive a modest tax credit.
- A \$20 million Green Infrastructure Training and Market Development Program could be developed to give local governments the information and tools they need to implement green strategies.
- A green roof tax incentive could be added to the next economic stimulus package. A 30 percent federal tax credit, budgeted at \$1.5 billion a year, would generate \$5 billion in green roof activity and at least 14,012 jobs.
- Finally, the federal government could lead by example, as it has begun to do, by requiring that all federal facilities use green infrastructure approaches.

■ The authors are board members of Green Roofs for Healthy Cities, an industry association based in Toronto. This article was adapted from *The Living Architecture Monitor*: www.greenroofs.org.

RESOURCES

ONLINE

Pew Charitable Trust: www.pewtrusts.org; Ecosystem Workforce Program: <http://ewp.uoregon.edu>; Clean Edge: www.cleaneedge.com; Renewable Fuels Association: www.ethanolrfa.org; RE-Powering America's Land: www.epa.gov/renewableenergyland; GreenList Source, a directory of more than 17,000 green companies: www.greenlistsource.com.

TELL US MORE

Is yours a green job? Tell the editors of *Planning* about it. E-mail slewis@planning.org.

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Educational Master Plan
Information Submission Form

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Pay Varies by Region for Administrative, Executive Assistants

Administrative and executive assistants often serve as the backbone of the office, taking care of the myriad necessary details so that managers and executives can focus on their primary responsibilities.

Salaries for these positions vary according to the region or city where the job is located. You can find up-to-date compensation information in the ERI Salary Assessor & Survey database from the Economic Research Institute.

Selected data. The administrative assistant performs various functions for an executive or an operating group. Typically, the difference between an administrative and executive assistant is the level of responsibility and autonomy in carrying out responsibilities.

Both positions are expected to be proficient in word and data processing, information systems, maintaining schedules, creating reports, and maintaining office equipment.

The highest average salary for an administrative assistant can be found in New York at \$53,290 (see Table). Next up is Los Angeles at \$49,776 and Denver at \$46,924. The lowest salary is \$41,806, in Orlando, FL. Just slightly further south in Miami, the average salary is \$43,534.

The executive assistant enjoys a slightly higher salary throughout most of the same cities. The highest average salary is \$64,275 in Washington DC. The cities with the second and third biggest

Average salaries for administrative and executive assistants, in select cities

	Administrative Assistant	Executive Assistant
Chicago, IL	\$48,321	\$63,454
Phoenix, AZ	43,520	57,814
Dallas, TX	45,307	60,843
Atlanta, GA	44,491	59,277
Charlotte, NC	44,207	59,100
Indianapolis, IN	43,760	58,261
Orlando, FL	41,806	56,264
Miami, FL	43,534	58,753
Denver, CO	46,924	61,904
New York, NY	53,290	53,290
Los Angeles, CA	49,776	49,776
Minneapolis, MN	48,023	62,673
Cincinnati, OH	43,562	57,530
Philadelphia, PA	47,361	62,130
Washington DC	48,736	64,275

Source: Economic Research Institute

A BNA Graphic/RSSVa01 t

paychecks are Chicago at \$63,454 and Minneapolis at \$62,673. Philadelphia follows with an annual average salary of \$62,130.

In New York—a locale with one of the highest costs of living—the salary is closer to the lower end of the pay scale, at \$53,290. The salary in Los Angeles—another high cost-of-living city—is even lower, at \$49,776.

Surveys Find Salaries, Job Demand for IT Starts to Pick Up

Decreased demand led to stagnant wages in 2009 for IT professionals, a report showing that pay rose less than 1 percent for this group found. Meanwhile, another report said pay for temporary technical professionals is on the upswing.

The Global Knowledge and Tech Republic 2010 *IT Skills and Salary Report* said salaries for IT professionals average \$82,115, up from the \$81,600 reported for 2009 (see Table 1). Pay rose 10 percent between 2008 and 2009, up from \$73,900.

Table 1
IT Compensation Trends
Over Three Years

	2010	2009	2008
Base Salary	\$82,115	\$81,600	\$73,900
Received a Raise	43%	70%	80%
Raise/Increase Amount	10%	6%	4%
Received a Bonus	39%	46%	49%
Average Bonus	\$8,654	\$8,575	\$3,937
Average Age	43	42	43
Years in IT	15	15	14
Male vs. Female	3.9:1	3.3:1	3:01
College Degree	69.70%	67%	59%

Source: Global Knowledge/Tech Republic A BNA Graphic/RSSVa011

This year, only 43 percent of IT pros received a raise, compared with 67 percent and 57 percent, respectively in 2009 and 2008. In addition, 11 percent said their pay was cut.

Of those who received a raise, the average increase was 9.8 percent, while the median raise was 4.6 percent, according to the survey.

The survey found that systems engineers, security professionals, and technical analysts were more likely to receive a raise than IT pros in other areas. In addition, those working in departments with staffs of 250 people or more tended to receive a raise.

Salaries varied according to job title. The IT executive has the highest average salary, at \$127,073, followed by the \$102,894 paid to the IT architect (see Table 2). The IT department head or director earned \$100,757.

IT positions with supervisory responsibilities are paid more. An IT project manager earns an average of \$94,457, while an IT manager takes home \$87,934, according to the survey. A network administrator is paid an average of \$63,160, and an IS/IT technical analyst gets \$69,886.

Fewer bonuses. Bonuses also declined, according to the survey, which reported that only 39 percent of IT professionals received one, compared with 46 percent the prior year.

Table 2
Average IT Salaries by Job Role

	Salary
IT Manager	\$87,934
Network Administrator	63,160
IT Project Manager	94,457
System Administrator	67,393
IT Department Head or Director	100,757
IT Consultant	87,739
IS-IT-Technical Analyst	69,886
Systems Engineer	85,032
Technical Support or Helpdesk Professional	54,732
IT Architect	102,894
Software or Applications Developer	82,151
Other IS, IT or Technology Function	65,560
Telecom or Voice Professional	74,580
Engineer	84,446
Technician	53,342
Security Professional	87,408
Network or LAN Manager	77,788
IT Executive (CIO, CTO, etc.)	127,073
Business Analyst	75,525
Database Administrator or Manager	83,256

Source: Global Knowledge/Tech Republic A BNA Graphic/RSSVa021

This was the case despite the fact that 85 percent reported being involved in a bonus program. The average bonus barely budged, going from \$8,575 in 2009 to \$8,654 in 2010.

Personal performance was the primary criteria for a bonus, followed by profit sharing and meeting project goals.

Performance and certification pays. According to the Global Knowledge and Tech Republic study, some of the factors for receiving a raise include: job performance (64.6 percent), standard company increase (44.2 percent), additional responsibilities (17.2 percent), and promotion (14 percent). In addition, 12.9 percent received a raise because they developed new skills and certifications.

IT professionals who have undergone additional training are paid more, according to the survey. Those professionals earned an average of \$83,106, compared with \$80,130 for those who did not receive additional training.

Those who earned certifications also were rewarded. Holding a Project Management Professional (PMP) certification translated into an average salary of \$104,253 (see Table 3). This is one of the most popular certifications, and these IT professionals are among the highest paid, the survey found.

Table 3
Average Salary by Popular Certifications

	Salary
PMP- Project Management Professional	\$104,253
CCNA- Cisco Certified Network Associate	79,695
MCP- MS Certified Professional	74,438
MCSE- MS Certified Systems Engineer	86,454
ITIL v3 Foundation	101,185
MCSA- MS Certified System Administrator	76,337
ITIL v2 Foundation	102,128
CompTIA- Network +	70,902
CompTIA- A+	68,631
CompTIA- Security+	76,844
CISSP- Cert Info Sys Security Professional	99,928
CCNP- Cisco Certified Network Professional	89,864
Other Project Management Certificate	95,979
Vmware Certified Professional	91,271
Six Sigma	111,908
MCITP- MS Certified IT Professional	82,044
Other Business Process Certifications	94,383
CCDA- Cisco Certified Design Associate	93,953
MCDST- MS Certified Desktop Support Technician	70,197
MCTS- Windows Vista Configure	71,786

Source: Global Knowledge/Tech Republic A BNA Graphic/RSSVa03i

The Cisco Certified Network Associate (CCNA) and MS Certified Professional are also very popular, but the average salaries are not nearly as high, at \$79,695 and \$74,438, respectively.

Pay and satisfaction. IT professionals who said they are fairly compensated report greater satisfaction with their job, and are less likely to plan on job hunting in the coming months, the survey found. Of those who are unhappy with their pay levels, 77 percent say they are job hunting (versus 15 percent who feel fairly compensated).

In terms of job satisfaction, 88 percent said competitive salary was the most important factor, followed by respect for work performed (82 percent), opportunity to increase skills (80 percent), competitive benefits (79 percent), and work-life balance (78 percent). IT employees with less than five years of experience ranked "opportunity to increase skills" far higher than those with more years on the job.

Pay for temporary technical pros. In another report, the Yoh Index of Technology Wages found that wages for temporary technical professionals are on the upswing, an indication that the salary and job market for IT professionals, in general, is recovering. The Yoh Index reported a 2.34 percent increase in pay in early 2010 (see Table 4).

Table 4
Yoh Index of Technology Wages Q1 2010

Week	2001	2009	2010	YoY Rate Change	Q1 Index	Period Index Change
4	27.93	31.38	31.38	-4.37%	112.34	-1.64%
8	28.05	31.05	31.06	0.03%	111.20	-1.01%
12	27.92	31.46	31.78	1.02%	113.8	2.34%

Source: Yoh Index A BNA Graphic/RSSVa04i

Temporary employee wages generally are considered an early indicator of future jobs creation, since employers will first use temporary employees in an improving economy, the Yoh Index said. An increase suggests that demand for these professionals grew in the first quarter of 2010 and that this demand increased temporary labor costs.

As these costs rise, employers tend to moderate that investment by hiring full-time workers, transforming variable to fixed costs, once convinced of future economic strength.

Companies may need to hire more temporary and permanent IT pros to catch up in certain technical areas, such as security and cloud computing. Consumerism is also a factor—the trend towards having employees wanting IT at their workplace to

incorporate their personal technology, such as iPads and iPhones.

Purchase Information: *The 2010 IT Skills and Salary Report from Global Knowledge and Tech Republic is available online at <http://www.globalknowledge.com> and <http://www.techrepublic.com>. Cost: free*

The Yoh Index is created by Yoh Services, a technology consulting and personnel company. For more information about the Yoh Index, go to <http://www.yoh.com/yohindex> or <http://www.theseamlessworkforce.com>.

Industry Surveys Find Publishing Salaries Stagnate

A survey of publishing industry salaries found that, in the past year, 35 percent in this field did not receive a raise, while another 21 percent received a raise of less than 3 percent.

Overall, the average raise was 3.3 percent, according to *Publishers Weekly*. In addition, 70 percent reported that their companies had instituted a salary freeze, and 63 percent had a hiring freeze.

Selected data. Bonuses declined as well; the number of employees who received one dropped from 53 percent to 45 percent, the survey found.

According to the survey, the typical bonus for editorial positions was \$2,500 (with 34 percent receiving one), and \$6,000 for 45 percent of sales and marketing personnel.

Publishers Weekly said that, By region, those working in the editorial area earn the most in the West (\$59,000) (see Table). Companies in the South pay slightly less (\$56,000).

The typical editorial salary is \$52,000 in the New England region and \$50,250 in the Mid-Atlantic. In the Midwest, the median salary is \$47,000, according to the survey.

The highest median salary for sales and marketing is in the West, at \$70,000. In the New England region, the median is \$59,000. The lowest salary for this group is \$55,000, in the Midwest.

Median Salary in Publishing Industry, By Region and Job Area

	West	Midwest	South	New England	Mid-Atlantic
Editorial	\$59,000	\$47,000	\$56,000	\$52,000	\$50,250
Sales & Marketing	70,000	55,000	56,000	59,000	57,500
Management	149,000	85,000	107,000	110,000	135,500
Operations	56,000	46,500	49,900	53,000	n/a

Source: *Publisher's Weekly*

A BNA Graphic/RSSVa01p

The operations side of publishing earns similar median salaries throughout the regions. The median salary in the West is \$56,000, the survey said. The highest salary for operations is in the Mid-Atlantic at \$62,000; the lowest is in the Midwest at \$46,500.

Management earns a higher median salary. By region, it tops out at \$149,000 in the West, and \$135,500 in the Mid-Atlantic. Again, according to the survey, the Midwest has the lowest median salary at \$85,000.

Experience does pay for the publishing professional. In editorial, those with less than three years of experience take in median compensation of \$32,000, the survey found. This jumps to \$40,000 with three to six years of experience, and to \$54,500 with seven to 10 years of experience.

With over 10 years in the field, median comp comes to \$80,250, according to the survey.

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Educational Master Plan
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Will the U.S. Auto Market Come Back?

TED H. CHU and YINGZI SU*

In the Great Recession, the automotive industry has been one of the hardest hit sectors, along with the housing and financial industries. As the largest and most cyclical consumer spending sector, the automotive sector has historically been important for economic recovery after every postwar recession. Will it be the same this time? Will consumer demand for new vehicles stay depressed in a prolonged deleveraging process? In this paper, we present an analysis of the fundamental factors that determine long-term vehicle demand, together with the factors that drive its cyclical fluctuations. We believe the recovery of the auto industry is inevitable and that it will again become an important driver of the mid-term U.S. recovery. However, a quick return to the precrisis peak is unlikely, given the slow recovery of employment and housing markets and higher energy prices.

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The Great Recession that began in 2007 signaled the end of an era when the U.S. economy seemed to have ditched the business cycle, with an average real GDP growth rate of 3.3 percent between 1992 and 2006 and nominal domestic demand growth hovering around 5.5 percent. However, the collapse of the subprime mortgage

market quickly turned into the worst financial crisis in 75 years. Though extraordinary measures by the Federal Reserve Bank prevented a systematic breakdown of the financial system, wild-fires on Wall Street engulfed Main Street as credit conditions tightened up enormously and credit flows contracted significantly. The flow of consumer credit went from the cycle peak of \$173 billion in 2007:Q3 to -\$166 billion in 2009:Q2; and even as of 2010:Q1, it was still negative. As a result, U.S. consumption expenditure declined 1.9 percent over the six quarters from 2007:Q4 to 2009:Q2. This marks the longest decline in post-WWII history.

In this credit-driven recession, one of the hardest hit sectors was the automotive industry, along with the housing and financial markets. Chrysler and General Motors were pushed into bankruptcy; and 276,000 jobs in the automobile and parts industry were destroyed, a whopping 36 percent of the total employment in the sector. The collapse of the auto market in turn exacerbated the downturn. Hamilton [2009] argues it would be hard to defend the claim that the recession began in 2007:Q4 had it not been for the contribution from auto sector.

The vehicle industry is by far the largest (through its extensive upstream and downstream economic linkages) and most cyclical consumer spending sector and has historically been an important impetus for economic recovery after every postwar recession. Will it be the same this time, now that the economy seems to be finding a

The views expressed in this paper are the authors' own and do not represent those of the General Motors Company.

*Ted H. Chu is the Chief Economist and Director of Corporate Planning at General Motors Company, where he leads a team of economists and analysts to conduct global economic and industry research in support of the corporation's planning, marketing, and strategic investment decisions. He is actively engaged with senior management in the company's business decisions. He has been appointed as a corporate professional fellow at GM. Also, he is an adjunct professor at Lawrence Technological University; the founder of the CoBe Institute, a philosophical research organization; and a past president of the Washington Chinese Professional Association. He has a Ph.D. from Georgetown University and a B.A. from the School of Management, Fudan University. Dr. Yingzi Su is a senior economist at General Motors, where she is responsible for intelligence, analysis, and forecasts of the economy and automotive industry in the United States, Canada, and China. Dr. Su played a critical role in supporting General Motor's restructuring efforts during the 2008–2009 recession. Prior to joining GM, she was a senior manager at J. D. Power and Associates, where she was responsible for forecasting vehicle residual value. Dr. Su earned her Ph.D. in economics from Wayne State University and her Bachelor's degree in economics from Peking University.

bottom? Will consumer demand for new vehicles stay depressed in a prolonged deleveraging process? Some have suggested that the automobile sector has experienced the same bubble as the housing sector and that it will never return to boom conditions again [Boudette and Shirouzu 2008].

In this paper, we compare the recent performance of the housing and automobile markets and present an analysis of the fundamental factors that determine the long-term vehicle demand, together with the factors that drive its cyclical fluctuations. The recovery of the U.S. auto market seems inevitable given the rapid accumulation of pent-up demand, and the strong rebound of the auto sector will be among the most important drivers for the medium-term recovery of the U.S. economy. However, a quick return to precrisis level of vehicle sales is unlikely given the prospect of slow employment and credit growth and the possibilities of significant gasoline price increases in the years ahead. With much uncertainty, the performance of the auto sector will continue to be a key barometer of the health of U.S. consumers and the economy.

1. Twin Fallouts of The Great Recession—Housing and Auto

Although economic pain is widespread, this recession is really concentrated in two sectors—housing and automobile. Table 1 shows that, measured in 2005 constant dollars, U.S. real GDP declined from 13.4 trillion to 12.9 trillion from the start of the recession till 2009:Q2, a drop of 3.7 percent. During the same period, automobile production was down from \$403 billion to \$223 billion and residential investment dropped from \$525 billion to \$344 billion. In other words, the slump in these two sectors contributed roughly 74 percent of total GDP contraction in this recession! It is worth noting that the service sector actually grew one percent during this period.

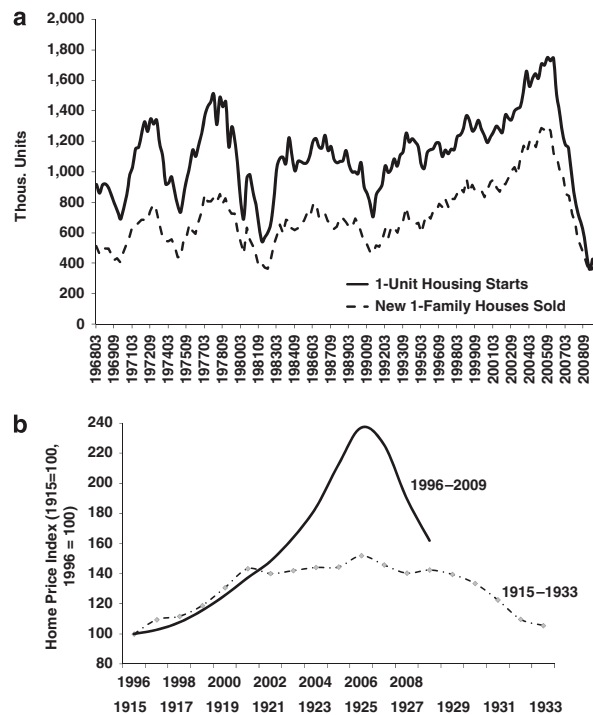
From its peak at 2005:Q4, real residential investment fell 56 percent—from \$783 billion to \$345 billion (measured in 2005 dollars). As a share of nominal GDP, residential investment fell from the peak of 6.25 percent in 2005:Q4 to 2.45 percent in 2009:Q2. Figure 1 shows that housing starts fell to the lowest level in at least half a century. Single-unit starts fell 80 percent from the record high of 1.8 million in November 2005 to the record low of 0.36 million in January 2009. Meanwhile, new single-family home sales fell 78 percent from the

Table 1. Housing and Auto in the 2008–09 Great Recession

Quarter	Auto Production (Bil 2005\$)	Residential Investment (Bil 2005\$)	GDP (Bil 2005\$)
Impact of housing and auto on real GDP			
2007:Q4	403.4	525.0	13,391
2008:Q1	379.6	483.2	13,367
2008:Q2	339.3	462.9	13,415
2008:Q3	333.6	443.3	13,325
2008:Q4	279.8	415.0	13,142
2009:Q1	215.9	367.9	12,925
2009:Q2	222.7	344.4	12,902
Difference	-180.7	-180.6	-490
% change	-45%	-34%	-3.7%
Contribution to GDP change	37%	37%	

Source: Bureau of Economic Analysis.

Figure 1. The Collapse of Housing Markets



Source: Census, Grebler, Blank and Winnick/U.S. Department of Commerce; S&P/Case-Shiller.

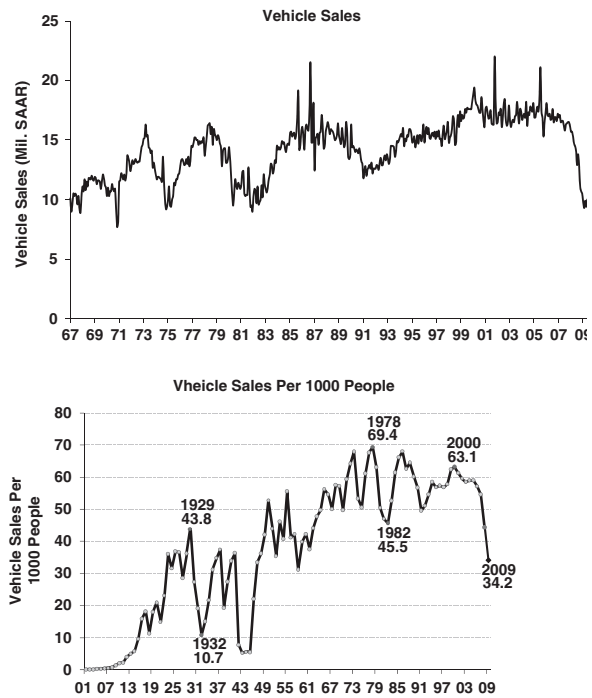
peak of 1.4 million in July 2005 to 0.33 million in January 2009. This housing bubble has been even larger and the bursting even greater than during the Great Depression. From 1915 to 1925, U.S. home prices rose 52 percent, followed by a 30 percent decline through 1933. This time, housing prices rose a stunning 137 percent increase from 1996 to 2006, as measured by S&P/Case-Schiller home price index. So far, it has decreased 30 percent as of 2009:Q2.

There is a broad consensus that household wealth, in the form of home equity, supported household spending after the technology stock bubble burst in 2001; but the magnitude of the impact is a subject of debate. A 2001–02 survey by Federal Reserve researchers Canner and others [2002] found that cash-out refinances were used for home improvement (35 percent), consumer and other debt repayment (26 percent), consumer expenditures (16 percent), and investment (21 percent). Greenspan and Kennedy [2007] provided solid historical data on the disbursement of equity extraction that showed parallel rises of home value, home equity withdrawals, and propensity of consumption. Benjamin and others [2004] estimated that every one dollar increase in home equity led to roughly eight cents of additional consumption, with the impact four times larger than that of other financial assets, while an econometric analysis by Macroeconomic Advisors found no empirical evidence that home equity withdrawals led to higher personal consumption.

Now there is renewed interest in the adverse effect from the burst of the housing market bubble. Mian and Sufi [2009] claim that money extracted from home equity was not used to purchase new real estate or to pay down high interest credit card debts; rather it was used for real outlays—consumption or home improvement. They also found home equity-based borrowing was stronger for younger households, households with low credit scores, and households with high initial credit card utilization rates. These households also saw sharper reductions in auto loans from 2006 to 2008, which offered one explanation for the plummet of automobile sales during the downturn. The auto market rode the housing market up and down.

It has always been true that durable goods are the biggest casualty of every recession. Among durable goods, a new car is the ultimate deferrable purchase. Since most American households already own one or more vehicles, it is easier to hold onto

Figure 2. The Collapse of U.S. Vehicle Sales



Source: Ward's Yearbook, Bureau of Economic Analysis, Census Bureau, General Motors.

the “old clunker” a bit longer or turn to the used vehicle market.

Yet the collapse of automobile sales dropped well below the previous recession troughs as the market was hit by three “rogue waves”: high gasoline prices, the credit crunch, and job losses. Spending on new vehicles as a share of disposable personal income sank to 2.7 percent in 2009:Q2, comparing to the troughs of 4.1 percent in the 1991 recession and 3.7 percent in 1980–82 recession. The historical average is 4.9 percent. Figure 2 shows that the lowest total vehicle sales (including medium and heavy duty trucks) in this cycle so far was 9.3 million in 2009 (as measured by the Seasonally Adjusted Annual Rate), the worst since December 1981, when nine million new vehicles were bought. But the U.S. population is 30 percent larger today: 307 million in 2009 vs. 230 million in 1981. On a population-adjusted basis, 2009 auto sales of around 10.5 million (partly boosted by the government-sponsored Cash-for-Clunkers program) will mark the lowest sales since 1958. The peak to trough decline of 40 percent is the worst since 1941 [Hughes-Cromwick 2009].

In stark contrast to the utter collapse of the housing and auto industries, consumer spending on durable goods excluding autos declined a modest 6.5 percent during the recession, nondurable goods spending decreased nearly 3 percent, and service sector spending increased 0.3 percent. Even though the Bush and Obama administrations spent tens of billions dollars rescuing automakers and parts suppliers, unemployment in the Mid-West region rose well above the national average, along with states hit hard by the housing crisis.

Understanding just what happened with the economy and the structural drivers behind the dynamics will help us get a better grasp of the drivers for the recovery as well as the risks ahead. One view is that since the auto sector has dropped so low, the pent-up demand will make it play a key role in the recovery.

2. Is the Auto Market Still Structurally Sound?

Given the similar rate of collapse, it is tempting to tie strong vehicle sales earlier this decade into both the credit bubble and frenzied activities in the housing market. For example, Jeff Rubin [2009] argued in a March 2009 report, “Just as two million housing starts proved to be a bubble, so was the average 16 million unit (light duty) auto sales of the last five years. Auto sales have already plunged to 30-year lows and consumer deleveraging will take them even lower. Annual vehicle sales are likely to stabilize somewhere in the 8 to 9 million range over the next half-decade as vehicle ownership rates retreat back to late 1980s levels.”

Mr. Rubin’s view may be extreme, but few people expect vehicle sales to return to 17 million units over the next few years. The perception of twin bubbles is there, both fueled by easy credit. But we believe there is a fundamental difference between what happened in the housing market and in the auto market. Whereas the housing bubble was inflated by the excessive risk-taking on Wall Street and widespread belief that housing prices were a one-way bet, the auto market boom was driven by structural rigidities in the domestic auto industry, which forced automakers to keep factories running by subsidizing vehicle consumption at both fleet and retail consumer levels. Although automakers offered plenty of cut-rate auto loans and leases, and lending standards were loosened for virtually all consumer lending during the boom, there was no equivalent of subprime

lending in auto financing. (Indeed, auto loan delinquency rates were driven up by job losses after the worst of the Wall Street panic was over.)

Most importantly, enormous speculative activities that were immediately amplified by financial derivatives existed in the housing market but not in the auto market. Housing was treated as investment instrument by speculators betting on a continued rise of home prices, but nobody thought cars would increase in value over time. Thus, housing prices and construction activities deviated much further away from the fundamentals than auto sales.

So what is the structural or secular level of automobile sales? America is said to be a country on wheels and Americans seem to love cars and trucks more than any other country in the world. With roughly 70 percent of people living in the suburbs without easy access to public transportation, owning a vehicle is simply a basic need in the United States. Over the last four decades, the U.S. auto industry has been hit by oil price shocks, economic recessions, regulatory changes, and technology revolutions such as the Internet revolution, yet one thing remains constant—the percent of people who are registered drivers.

Even after this Great Recession and after the doubling in fuel prices, we don’t foresee that people will move en masse back to urban centers and give up driving. Although movements at the margin draw our attention, the location of the existing real estate stock and the basic transportation infrastructure can only be altered over decades, not years. Even as consumers deserted new car dealers during the recession, used vehicle demand gained strength, and used vehicle prices have rebounded sharply after an initial plunge during this recession. The ultimate need for vehicles will continue to depend on how many people will drive a vehicle.

In this light, the simple dynamics of the total number of vehicles in operation—known in the automotive industry as “*parc*”—can be defined as below:

$$\text{Parc}(t) = \text{Parc}(t - 1) - \text{Scrappage}(t) + \text{New Vehicle Sales}(t)$$

New vehicle demand in a certain year is in turn the sum of the new demand (changes in *parc*) and the replacement demand:

$$\text{New Vehicle Sales}(t) = \Delta\text{Parc}(t) + \text{Scrappage}(t)$$

New demand depends on the flow of new drivers coming into the market and changes in the average number of vehicles per driver. Replacement demand depends on how many vehicles get scrapped every year that have to be replaced. The United States does not import a significant amount of used vehicles, although rising used vehicle exports to Mexico may marginally boost new vehicle sales in the United States [Chu and Delgado 2009].

As of the end of 2008, the parc distribution by vehicle age is shown in Figure 3. About 56 percent of vehicles on the road today are less than 10 years old. We can calculate the cumulative scrappage rate for vehicles sold in each model year by dividing the number of vehicles remaining at the end of 2008 by the number of new vehicles sold in that model year. We find the cumulative scrappage rate follows a typical S-curve. We then estimate it by fitting it into a logit model:

$$S = 1 / (1 + \exp(3.12 - 5.30 * A/E)),$$

where S is the cumulative scrappage rate, A is the vehicle age, and E is the vehicle life expectancy.

To test if the estimated model is a good fit, we use the above equation to estimate U.S. vehicle parc from 1977 to 2008. Overall the estimated parc is very close to the official parc statistics published by the U.S. Federal Highway Administration. The discrepancy is generally within 1 percent of the total parc. But there are two interesting episodes as exceptions: one occurred during and after the 1980–82 recessions, the other occurred in the 2001 recession. The estimated parc was noticeably smaller than the true parc, especially for the first episode. We attribute the discrepancies to people

holding onto their old vehicles longer during difficult economic times. At that time, the 1980 and 1982 recessions were the worst recession since WWII. They had a lasting impact on consumer behavior. In 2001, there was an immediate shock to vehicle parc within the year following the recession and the 9-11 terrorist attack, but consumers quickly returned to their normal spending patterns once they found the economy was not going to collapse. Aided by the housing boom, low interest rates, and aggressive automaker price and lease subsidies, vehicle sales never suffered a decline.

To address the effect of these shocks, we allow a “holding” factor in the logit model and re-estimate the parc, which improves the fit of the model. This is shown in Figure 4.

Following the 1980 and 1982 recessions, there seems to have been several years of behavioral adjustment, with people continuing to delay their purchase decisions and shrinking the replacement part of the new vehicle demand. Figure 4 shows holding time and the unemployment rate. High unemployment rates, which restrained access to credit, and higher purchasing costs that resulted from regulation are among the factors of why people increase their holding time.

The lingering reaction is likely to be more pronounced today than in the early 1980s. Indeed, the process of Americans shedding excess vehicles could last for years as part of the deleveraging process. According to CNW Research [2009], about 10 million U.S. households (roughly 6 percent of total) had more registered and licensed vehicles than licensed drivers in 2008. It is reasonable to assume a five-year period within which Americans will keep their vehicles roughly

Figure 3. Vehicle Distribution by Age

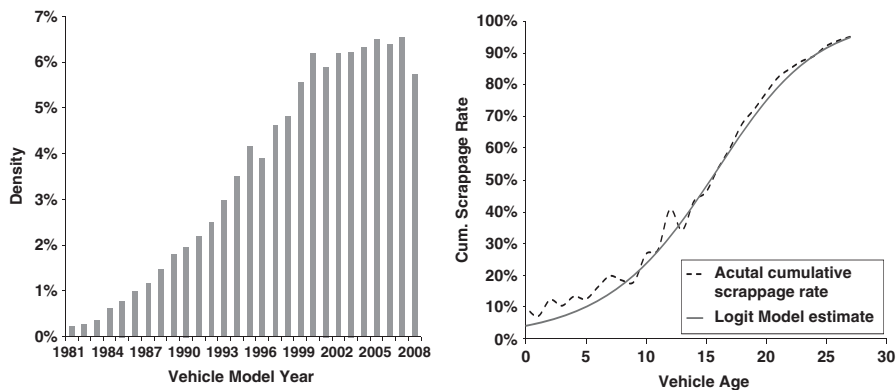
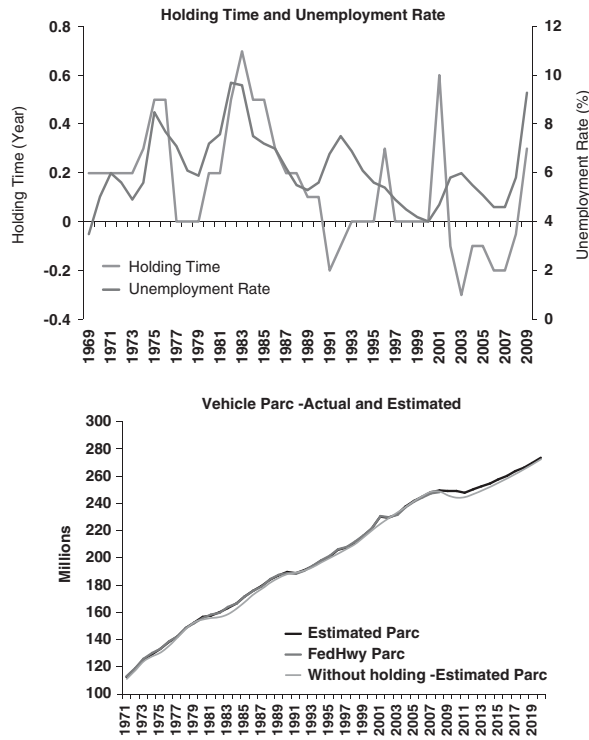


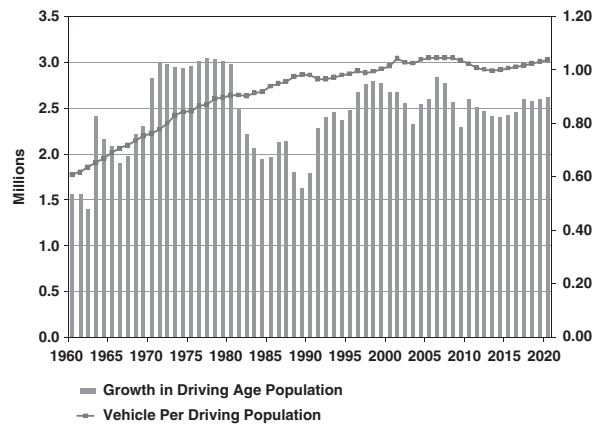
Figure 4. Estimation of Vehicle Parc



half-a-year longer, slightly more severe than what happened in the early 1980s. As shown in Figure 4, the parc is expected to decline slightly after 2009, breaking the long-term historical trend, and a more severe decline than what Japan experienced in its post-bubble “lost decade.” According to our estimate, the ongoing adjustment to a lower parc will last for several years. This will be the third most severe adjustment since the parc record started in 1901, exceeded only by the aftermath of WWII and the Great Depression, and more dramatic than the declines of parc in 1938, 1991, and 2002.

Partially offsetting the impact of people holding onto their vehicles longer is the new demand, which comes from the growth of the driving age population (16 years and older). The baby boomers started coming into the market in 1962, adding well over 2.5 million drivers per year over the decades of the 1960s and 1970s. After the smaller Gen X, Gen Y started entering the market in 1993, adding almost the same 2.5 million drivers per year. Over the next 10 to 15 years, we will not return to the peak years of new demand; but we will enjoy a steady stream of a net inflow of roughly two million

Figure 5. Growth in Driving Population and Vehicle Density



to the driving age population each year. This is shown in Figure 5.

The result is that the longer vehicle sales stay below trend, the more pent-up demand will accumulate. Eventually, new auto sales will have to increase significantly for the vehicle parc to catch up with the underlying need for personal transportation.

Even under our conservative assumption of longer vehicle holding periods and lower scrappage rates, the replacement demand is above 10 million units per year. Assuming the holding period gradually returns to its historical norm in the second half of the coming decade, the number of vehicles to be scrapped will average nearly 13.5 million per year for the decade of 2009–19. With the additional two million new drivers coming into the market every year, we believe the increase in auto sales may surprise to the upside at the next cyclical peak. The key determinants, then, are macroeconomic performance and vehicle ownership costs in the years ahead.

3. Economic and Cyclical Forecast of the Vehicle Market

While recognizing that many linkages between the auto market and macro economy, society, policy, and technology may be tenuous, the U.S. auto market is a mature one in the sense that there is a fairly consistent set of key factors that determine new vehicle demand over time. Most of these are economic and quantifiable—employment, gasoline prices, vehicle prices, housing starts, and the flow of consumer credit.

The historical co-movements of each of these factors with new vehicle sales are charted in the Appendix I. It is worth noting that consumer credit stopped being a significant explanatory factor during the Great Moderation when credit was plentiful, but it has returned as a key constraint on auto demand during the Great Recession.

The relatively stable demand structure enables us to develop simple yet powerful econometric models. We use quarterly data from 1967:Q1 to 2009:Q2 to estimate the following cointegrating relationship:

$$V = -0.703 + 0.000137 * E - 0.0048 * G - 0.00274 * P + 0.00386 * H + 0.0124 * C$$

(-0.4310 5.077 -2.4980)
(-3.3051 11.4974 6.8927)

R-squared = 0.8554 Durbin – Watson statistic = 0.8977
 Values of the *t* distribution are in parentheses.

where *V* denotes new vehicle sales, *E* is total non-farm payroll employment, *G* is gasoline prices, *P* is average car prices, *H* is single-family housing starts, and *C* is the flow of consumer credit. The coefficients of these factors are statistically significant and carry the expected signs.

Although Figure 6 shows that the cointegrating equation provides good explanatory power for the movement of vehicle sales, there are periods in which large residuals remain and persist. This prompts us to model the dynamics by using the error correction term from the cointegrating equation.

We specify the error correction term by using the one-period lagged residual from the cointegrating equation, denoted by *R*(-1) the difference of the independent variables from the previous period denoted by *d*(), as well as the one-period lagged dependent variable denoted by *V*(-1). Since people usually compare gasoline prices with that of last season rather than last quarter, we use the year-over-year difference instead (a four-period lag).

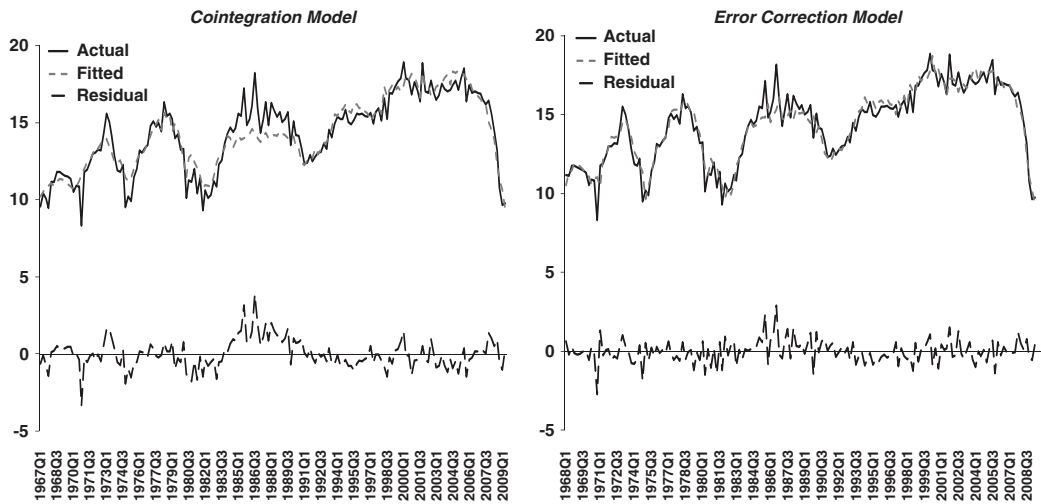
$$V = 0.214 + 0.976 * V(-1) + 0.00056 * d(E) - 0.0044 * d(G, -4) - 0.00039 * d(P) + 0.002 * d(H) + 0.010 * d(C) - 0.502 * R(-1)$$

(0.528 34.0 4.679)
(-1.852 -1.231)
(3.025 4.828 -7.252)

R-squared = 0.91 Durbin – Watson statistic = 2.3
 Values of the *t* distribution are in parentheses.

All coefficients of the independent variables carry the expected signs, and most of them are significant. The exceptions are the coefficients of gasoline prices and car prices. The mixed results of the cointegrating model and the error correction model suggest that gasoline prices and car prices have a significant structural impact on auto demand but insignificant cyclical impact—if the costs of running and acquiring a car are permanently higher, they will reduce new car demand since consumers tend to spend a fixed amount of income on personal transportation.

Figure 6. Modeling the Auto Industry—Actual, Fitted, and Residual



However, if the gasoline price increases are a short-term phenomenon, the impact on auto sales may or may not be significant since consumers may react more in the way of changing driving behavior and switching to more fuel-efficient and less expensive vehicles [Austin 2008]. Our previous econometric study focusing on vehicle prices also showed that when automakers aggressively cut vehicle prices, consumers react mostly by buying up rather than buying more—for example, choosing an entry-luxury car rather than a mid-size mainstream sedan. Again, this is a characteristic of a mature automobile market; and we believe that as vehicle prices are forced up due to more stringent CAFE or CO₂ regulations, consumer reaction will be mostly buying down rather than buying less. Over time, the costs of complying with new regulations tend to decline due to innovations and economies of scale effects.

The second interesting observation of this error correction model is R , the lagged residual term from the cointegrating equation. Regression results show roughly half of the deviation from the equilibrium in the previous period will be affecting the current period sales. With this short-term correction built in, the model can explain better the peaks and troughs of the sales shown in Figure 6. One possible explanation of this result is that consumer psychology and expectation of future economic well-being may deviate from fundamentals—when times are good, people feel good about their lives and more likely to make big-ticket purchases; the opposite is true when times are bad. There may be other unobservable cyclical factors such as automakers' and dealers' marketing efforts and effectiveness during cyclical peaks and troughs.

The above techniques are important tools to facilitate our daily work as business economists. They enable us to quantify the impact of changes in major factors on vehicle sales and provide a tangible framework to link the macro variables and auto sales.

4. Automobile Market Outlook and Risks

Our analysis shows that despite sound fundamentals in demographics and basic personal mobility needs, the future of the American auto market critically depends on the prospect of recovery in employment, the housing market, consumer credit, and other macroeconomic factors. In addition, supply-side factors such as oil prices and vehicle prices also play a significant role in

long-term structural demand and may impact the cyclical market outlook as well.

With the era of Great Moderation most likely over, the U.S. economy is facing unusually large uncertainties and challenges. Three macro tailwinds have largely dissipated: the end of the Cold War peace dividend, the IT revolution, and the goods-for-dollar bills exchange with East Asia. Before the next wave of a productivity-boosting technology revolution, the most likely future is one with somewhat slower growth and stronger cyclical volatilities. America is likely entering a period of profound adjustment—the domestic automobile industry can be seen as a symbol of that sometimes painful adjustment, with higher energy prices, more regulation, and ever-intense global competition. If the transformation is successful in overcoming previous structural rigidities, there is hope that the U.S. economy can get back on track in leading global economic development, including that of personal mobility. Without the transformation, we will be increasingly weighed down by heavy debt and by an aging population and infrastructure.

Thus in this section, we construct three scenarios—baseline, upside, and “lost decade”—to frame the outlook and test our thinking. These are not extreme scenarios, but they do highlight a reasonable range of uncertainties.

The baseline scenario

Our baseline scenario assumes the economy and auto market will recover gradually from the current cyclical bottom. We assume a slow recovery of employment, housing, and credit availability. The short-term challenges of the U.S. economy warrant these assumptions in the face of diminishing effects of fiscal stimulus, over-leveraged consumers, huge public debt, and a still-large current account deficit.

In this recession, the precariousness of household indebtedness has been underscored by the unprecedented destruction of wealth. As of 2010:Q1, even after a sharp rebound of stock markets and stabilization of home prices, U.S. household wealth still was down \$11 trillion, a loss of about 17 percent from its peak in 2007:Q3. Of course this was already better than the 27 percent drop that occurred in 2009:Q2. Consumer spending, which accounts for roughly 70 percent of the total economy, will take time to return to its good days with the underlying weakness.

The historical experience from around the world is that so-called balance sheet recessions often last longer and leave deeper damages than normal business-cycle recessions. Recoveries from such recessions also are usually slower than otherwise. According to the Federal Reserve Board's July 2009 Senior Loan Official Survey, less than 15 percent of surveyed banks plan to ease standards for mortgage, credit cards, or installment loans before the second half of 2010, with 42 percent saying they will never again adopt the standard they used in the past for mortgages, 32 percent for credit cards, and 25 percent for installment debt. This may well have a lasting seriously detrimental impact on consumer spending.

Finally, hangover from the extraordinary fiscal and monetary policies that prevented us from slipping into the second Great Depression are likely to cast a cloud over the longer term growth perspectives. Fears of higher inflation and higher taxes to cover the increased government debt almost certainly will make people more cautious about their spending. Recent analysis by Mark Zandi at Moody's Economy.com shows that it was the middle income families who piled on debt during the housing boom, but now are starting to save.

Our model results show auto sales rebound to roughly 12 million in 2010, up from 10.5 million in 2009, and rising steadily to about 16.6 million by 2015 before a steady state is reached, with sales rising roughly quarter million units per year in line with fundamentals thereafter. The baseline scenario is largely consistent with the five years of longer

holding periods and thus decreased replacement demand that we projected in the last section. The outcomes of this baseline, as well as our other scenarios, are shown in Figure 7.

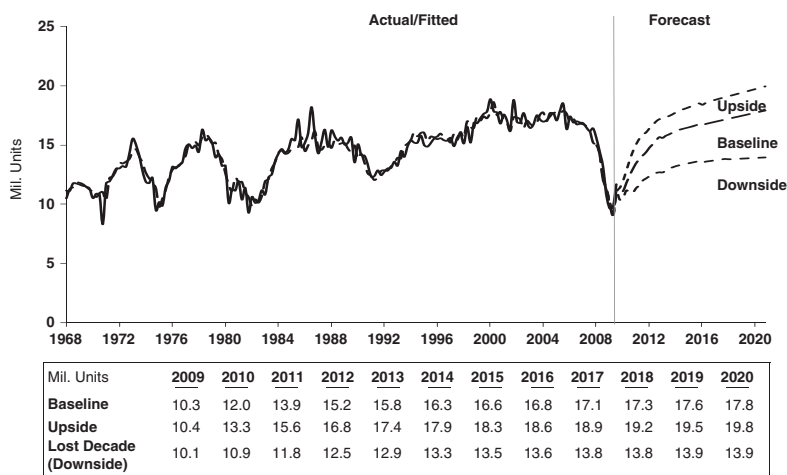
What does this mean for the economy? Auto production and consumer spending on new automobiles will only be able to provide a mildly strong thrust to the current recovery. We anticipate auto production will increase over 10 percent from 2010 to 2012 to meet the gradually recovered demand and to restore the normal inventory level, which will contribute roughly 0.3 percentage points to GDP growth, or 10 percent of total growth (not including spillover effects).

Nevertheless, a rebounding auto market will be one of the strongest elements in the cyclical rebound of auto-related employment and tax revenues and will provide a basis for solid growth after 2015. Cars are not dead, but America's love affair is now cooled by, among other things, tighter spending budgets, slower income growth, and higher gasoline prices. More people will treat their automobiles as a basic means of transportation; but the attractiveness of a shiny new car with its fresh styling, better quality, and higher performance will not be diminished in the years ahead.

The lost decade scenario

At this point our baseline scenario may seem too optimistic for many, even though the projection is substantially below the prerecession long-term trend line that suggests we should be a 17–18 million

Figure 7. Scenarios for the U.S. Auto Industry



market today. Our pessimistic “lost decade” scenario assumes the economic recovery loses momentum after the fiscal and monetary stimulus impacts diminish, taking a second dip somewhere down the road, and largely treads water thereafter. The economy and employment are so anemic that people do not feel the recovery is underway.

What is worse, the U.S. dollar is likely to depreciate further in this environment, driving up oil and commodity prices and feeding a vicious loop for further economic weakness. The balance sheet problems of the U.S. economy, in terms of heavy debt of household, financial, public, and external sectors, will take a long time to unwind. During this painful deleveraging process, exports resulting from the weaker dollar may be the only bright spot, but may not be able to pull the U.S. economy to a higher trajectory.

In other words, in this downside scenario America will suffer a Japan-like lost decade, with consumers, especially the younger ones, gradually losing interest in cars and deciding to divert expenditures to electronics. The older generation may no longer find it a status symbol to own multiple vehicles. In Japan, auto sales peaked at 7.6 million in 1990 and gradually trended down to the mid-6 million range in later 1990s before falling decidedly below 6 million this decade. Sales in 2009 were below 4.5 million.

We continue to believe, however, that with a drastically different demographics and transportation infrastructure, the U.S. auto market is unlikely to repeat the Japanese experience. Nevertheless, it may take a long time before market demand reaches the 15 million mark. Compared with the baseline scenario, consumer spending on new vehicles may even be lower than the unit projection suggests as more people choose less expensive cars to save money.

In this scenario, auto production and sales are likely to contribute only 0.15 percentage point to GDP growth, or 8 percent of total growth (not including spillover effects). Although substantially up from today’s depression levels, the automobile market will not regain its former vigor, even though more car sales will be met by domestic production thanks to a weaker dollar. The Midwest and other regions that rely heavily on the auto sector will not regain their economic health in the foreseeable future, even as they attempt to find alternative growth engines. The popularity of cheap automobiles may also open up market opportunities for Chinese and Indian automakers,

although they may be forced to assemble vehicles in North America because of rising protectionism.

The upside scenario

Not all is bleak in the outlook. Many doomsday predictions, such as GEAB [2009], have not materialized since the watershed event in September 2008. Despite the gloomy present, the possibility of a self-reinforcing up-cycle cannot be ruled out. The most reliable predictor of recovery strength after a recession in the post-WWII era is how deep the fall has been. We would like to end the discussion on a positive note by showing our upside scenario, which assumes above-trend growth for years 2011–14, accompanied by strong recovery of employment and the housing market.

The likely trigger for an up-cycle is the inventory rebuilding process and delayed impact of policy stimuli, not just in the U.S., but also in the global economy. The bright spot in the U.S. economy is the corporate sector, which reacted in lightning speed to the crisis by shedding excessive labor and capacity. With demand stabilizing, the corporate sector has a comfortable cash pile and increasingly will be looking for opportunities to expand and gain market share. Once hiring and final sales start to turn the corner, the inventory rebuilding cycle begins, which leads to more hours worked and higher income and spending. In the automotive sector, the sudden boost of “Cash-for-Clunkers” program is one illustration of how the cycle works, but we will need dynamics to play out on a much bigger scale over the years. Nonetheless, it can happen, with the automotive sector playing a pivotal role in the recovery since it is among the hardest hit cyclical sectors in the economy.

One additional boost to the auto market would be lower-than-expected oil prices, which are currently driven by a weak dollar despite ample inventory and surplus capacity. A strong recovery would allow the U.S. Federal Reserve to increase interest rates earlier than expected, sending a positive shock wave to the currency market that is currently betting on a prolonged period of near-zero policy rates in the United States. In this scenario, energy and commodity prices are likely to stay low, reducing the cost of building and driving automobiles in particular.

The upshot would be a market of over 18 million by 2015, almost doubling the sales reached in the lows of 2009. To put things in perspective,

auto sales hit a new high of 16.3 million in 1986, just four years after the trough of 10.5 million sales in 1982. We have 30 percent more drivers today and potentially a larger pent-up demand. It is worth noting that even in this upside scenario, we are merely projecting the auto market to return to its long-term historical trend, rather than going above it.

There is a virtuous cycle in the upside scenario. GDP hitting 4–4.5 percent in 2011 and 2012, auto production and sales contributing 0.4–0.5 percentage point to GDP growth, or 10 to 16 percent of total growth (not including spillover effects). The accelerating effect would slow by 2014, as pent-up demand and inventory adjustment effects dissipate.

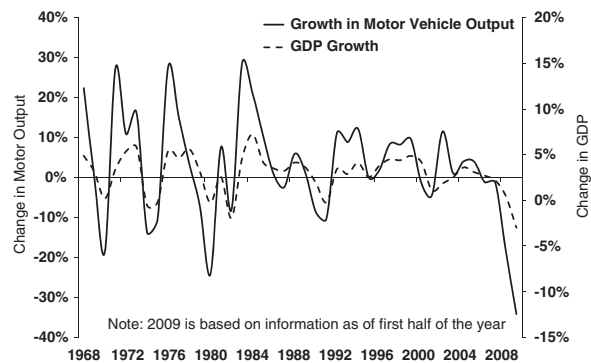
The wide range of our forecast may be surprising. But considering historical ups and downs as shown in the 40 percent variation from the peak to trough in this recession, our 30 percent forecast variance from upside to downside still seems reasonable. This is especially true when we believe that we are entering a highly volatile and uncertain economic arena comparing to the Great Moderation of the past decade.

5. Conclusion

Nearly three-fourths of the economic contraction during the Great Recession has been concentrated in two sectors—housing and autos. After assessing the fundamental factors of U.S. automobile demand, we believe the market is now well under the long-term trend. Our analysis indicates that the automobile market will come back, although the 17 million market in the early 2000s did benefit from easy credit and cheap oil.

The strength of the auto market recovery will be strongly associated with macroeconomic factors—employment, housing, and consumer credit flows—as well as cost factors such as gasoline prices and vehicle prices. Though the basic patterns for personal transportation are unchanged, how many people will be working and forming new households is critical to automobile demand. If the economy is entering a period of slower and more volatile growth, so will the auto market. The most likely scenario is for vehicle sales to return to the mid-16 million range by 2015 and then trend slowly

Figure 8. Motor Vehicle Output and GDP Growth



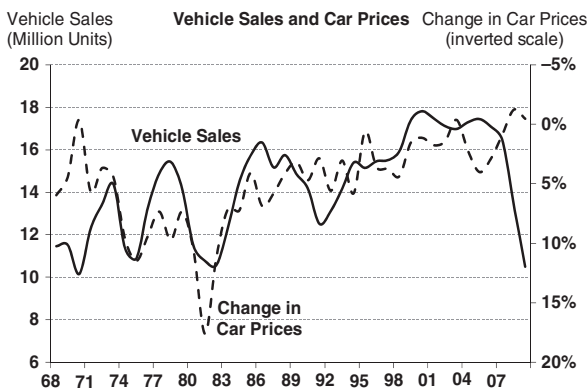
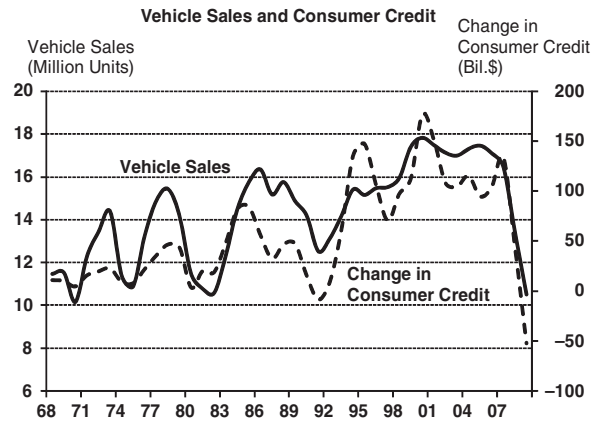
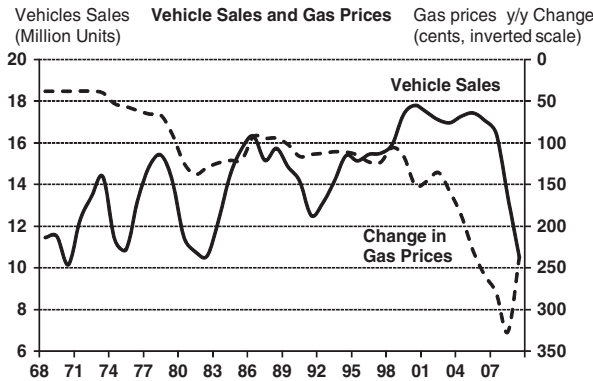
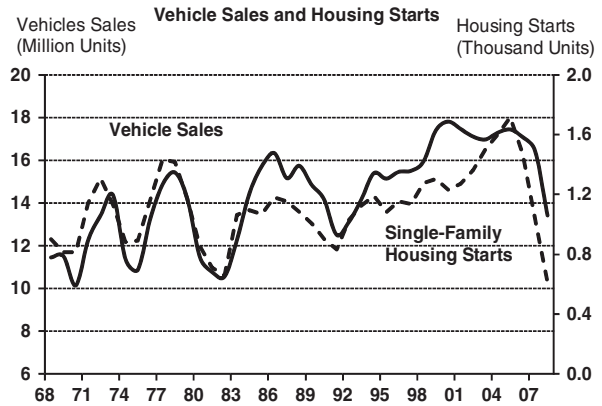
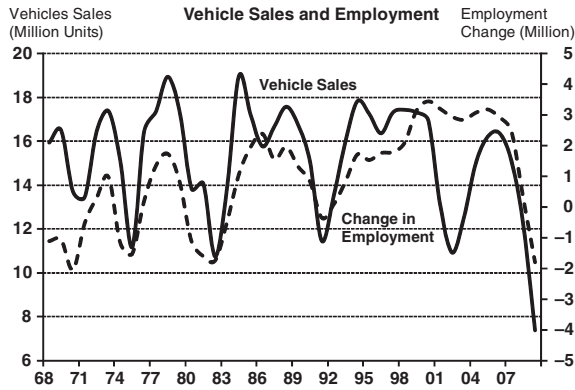
higher afterwards. But in this highly volatile economic and financial climate, it is not hard to imagine a downside in which the market endures a lost decade languishing at 14 million on the downside and an upside with sales quickly returning to an historical trend of around 18 million by 2015.

The idea that the housing market and the auto market have been equally affected by the credit-driven bubble is mistaken. Although both markets rely heavily on credit, housing played the leading role with the ills of subprime mortgages, mortgage-backed securities, and other well-documented problems—amplified for households through the wealth effect. There was no counterpart in the auto market, which was essentially taken for a ride, both up and down. The auto market is likely to recover sooner since cars wear out much faster than houses.

The positive feedback of the auto market on the broader economy is significant. The automobile industry represents one of the most significant sources for recovery, simply because of both the magnitude of its historical size and the depth of its collapse. In previous recoveries, auto sector recovery has always been a major force to lead the economy out of recession, as shown in Figure 8. This time should not be the exception. After falling 40 percent in sales and 50 percent in production from their peaks, the auto sector is undergoing a significant structural transformation and is in a good position to spring forward and eventually exceed its previous level and contribution to the U.S. economy.

APPENDIX I

Correlation between Vehicle Sales and Key Determinants



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Educational Master Plan
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WHERE THE JOBS ARE

Healthcare Jobs Galore

An aging population and new initiatives bode well for employment in this industry

WHITNEY GOLDSBERRY WASN'T SURPRISED TO LAND A healthcare job within two weeks of receiving her master's degree in communication sciences and disorders in May 2009 from Emerson College in Boston. "It took most of the people in my program less than a month to find a job," says the speech-language pathologist for special needs children. "There's just such high demand." She attributes the need to changes in laws that have made speech therapy more available to children at an earlier age, the number of veterans with impaired speech as a result of head injuries, and our aging population. With an 11% employment growth projected between 2006 and 2016 and an average salary of \$75,000, speech pathology is just one of many growing jobs available in healthcare.

Despite staggering job losses overall in 2008 and 2009, the healthcare sector actually added hundreds of thousands of jobs. According to the U.S. Department of Labor, nearly 22% of all wage and salary jobs added to the economy between 2006 and 2016 will be in the healthcare sector. Although much has been reported about the nationwide need for nurses, qualified employees are needed throughout the healthcare industry. Opportunities abound, but knowing industry trends and occupational requirements will make all the difference in securing a post in this field.

YOUR JOB SEARCH

Jobs in healthcare can be categorized into four broad groups: managerial, business, and financial; professional; service; and office and administrative support. Positions within these groupings require a range of experience and myriad educational, certification, and licensing credentials—and they don't necessarily involve patient care. There are a number of managerial and administrative positions for which job seekers who lack a health or science background but have basic business experience can apply. Even those who have a clinical background can find jobs that don't directly involve patients, if they prefer such as case managers and nurse educators.

EDUCATION, TRAINING, AND ADVANCEMENT

The level of education and skills needed to work in the healthcare industry varies greatly, from an associate degree to a doctorate. Aspiring physician's assistants must complete an accredited two-year program and pass a licensing exam. To become a medical scientist, a student must obtain, as a minimum requirement, a doctorate in biological science. Ona Okoro, a staff nurse at a veterans hospital in St. Louis, could have entered her profession with just an associate degree, but instead she obtained a bachelor's in psychology and then a second bachelor's in nursing. "There are more opportunities with a bachelor's degree," she says. "It's a

Cost of Care

The rising cost of healthcare has changed the way many hospitals and physicians administer care. While many insurance companies are less affected because of their practice of keeping premiums higher than the claims they have to pay, healthcare providers are finding new ways to care for their patients while cutting costs. This means shorter hospital stays and doctors overloading patient visits to cover the costs of their private practice. Because of this, there is an increased need for home care administrators. While hospital positions will increase by 13%, home health aide positions will increase by 48.7%.

Alternative Treatments

People are increasingly turning to alternative therapies to treat their ailments. Homeopathy, acupuncture, massage therapy, and chiropractic are just a few of the methods that have not only been embraced by patients but are reimbursed by insurance companies as well.

PROFESSIONAL ORGANIZATIONS

- American Pharmaceutical Association
- American Physical Therapy Association
- American Association of Medical Assistants
- American Association of Nurse Practitioners
- American Nursing Association
- American Medical Association

EMPLOYERS

- Blue Cross and Blue Shield Association
- United Health Group Inc.
- WellPoint Inc.
- Medco Health Solutions Inc.
- Caremark L.L.C.
- Kaiser Permanente
- HCA Inc.
- Aetna Inc.
- CIGNA Corp.
- Express Scripts Inc.
- Mayo Clinic
- NetApp
- Genentech Inc.
- Children's Healthcare of Atlanta Inc.
- Scripps Health
- Ohio Health
- King's Daughters Medical Center
- Methodist Hospital System
- Intelligent InSites Inc.
- Sage Products Inc.
- VHA Inc.
- Medical establishments that accept Medicare and Medicaid
- Health IT companies



For more info on finding the right opportunity in the healthcare industry, go to www.blackenterprise.com

boost to your résumé." Okoro plans to get a master's degree once she's gained more work experience. Although many positions in healthcare require only an associate degree, more and more jobs are beginning to up the educational ante. For example, more entry-level nursing positions are requiring a bachelor's degree, and there is a push to extend the requirement industrywide.

Salaries in the healthcare sector, just as in any other, depend upon position, experience, education, and location. For an entry-level clinical research technician position in Omaha, Nebraska, the average pay is \$34,111; the same job in San Diego offers an average salary of \$40,192. Having a master's degree will likely increase your salary wherever you reside.

THE NEW 'IT' POSITION

The Obama administration has established new initiatives and legislation to digitize medical records and use more technologically managed systems to enhance patient safety and cut costs, such as the new medication administration system that uses barcode technology to track how and when patients receive their medication. The administration has also earmarked significant stimulus funds for this project. Of the \$317 billion from the stimulus package (the dollar amount that excludes monies allocated for tax provisions), \$66.15 billion has been dedicated to the labor, health, and education sectors; \$19.57 billion has been

dedicated to the Department of Health and Human Services. Although much of the stimulus money won't be distributed for another year and a half, many institutions are now hiring in preparation for when it does become available.

According to the *2000-2010 Job Outlook in Brief* published by the Bureau of Labor Statistics, computer information systems managerial positions are slated to increase at a rate much faster than average. "Healthcare needs every IT person we can get our hands on," says Gregg Veltri, chief information officer at Denver Health Medical Center, which is in the top 2.5% of hospitals in the nation that leverage technology for patient care. What's needed to successfully transition from paper to digital records, according to Veltri, is people with experience in traditional information technology, but it's also helpful to have those with clinical backgrounds working as technological liaisons. Called clinician hybrids, these professionals use their clinical knowledge to ensure that the systems being created will actually be useful. Although the tendency may not be to initially link healthcare and technology together, Veltri says, they have more to do with each other than you might think. "We have the same technology that other businesses have; we just have the added complication of having these healthcare systems that are used to provide patient care, so mistakes cannot be tolerated." —Benice Atufunwa

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Career Opportunities

What are the job prospects for today's—and tomorrow's—graduates?

LAST FALL, JIM Wordelman found himself in an enviable position. At a time when unemployment for recent U.S. college graduates was at the highest level since 1983, Wordelman, a senior at the University of Illinois at Urbana-Champaign's (UIUC's) Department of Computer Science, had several job offers from companies that wanted to hire him the following summer. Eventually, he took a job with Microsoft as a developer on its Internet Explorer team. "I did work for the company before and loved it," Wordelman explains. The job also put him in a position to follow his greatest passion: accessibility.

If recent data is any indication, Wordelman's case is not unique among computer science graduates in the U.S. (the job prospects for graduates in the United Kingdom, China, and India are discussed later). In fact, his fellow UIUC CS graduates received an average of 2.4 job offers this year. The mean starting salary: \$68,650. "Our undergrads have had no trouble getting positions," says Rob Rutenbar, the department head. "Most of them are doing things like software development. Some launch entrepreneurial ventures."

At Carnegie Mellon University (CMU), the job outlook is equally rosy: 95% of this year's CS students had jobs waiting for them upon graduation. "Companies may be a little choosier, but they are still hiring," says Susanne Hambrusch, a computer science professor at Purdue University, where graduates enjoyed mean starting salaries of \$66,875 last year.

According to projections from the U.S. Bureau of Labor Statistics (BLS), computing will be one of the fastest-growing job markets through 2018. Employment of software engineers, computer scientists, and network, database, and systems administrators is expected to grow between 24%–32% through 2018. They account for 71% of new jobs among the STEM (science,



Computer science graduates at Carnegie Mellon University, shown above, and other schools often have jobs waiting for them upon graduation.

technology, engineering, and mathematics) fields. For a discipline that is still struggling with the public perception that its jobs are migrating offshore, such career predictions offer an important counterpoint.

Of the new jobs, according to BLS projections, 27% will be in software engineering, 21% in computing networking, and 10% in systems analysis. Software engineering alone is expected to add nearly 300,000 jobs in the next eight years.

Computer programmers will fare less well, with a projected decline in employment of 3% through 2018. The BLS cites advances in programming tools, as well as offshore outsourcing, as contributing factors to this decline. Nonetheless, the federal agency predicts employers will continue to need some local programmers, especially ones with strong technical skills. And many companies, having discovered that outsourcing is more challenging to manage than anticipated, are turning to domestic outsourcing to complete their

programming projects, which is a trend the BLS expects to continue.

"The BLS projections are pretty compelling," says Peter Harsha, director of government affairs at the Computing Research Association (CRA). "We're optimistic."

College students seem to have picked up on that optimism, and are returning to the field after a steep six-year decline caused by the dot-com crash. According to the Taulbee Survey, an annual CRA study that gathers data for North American computer science and computer engineering programs, the number of computer science majors rose 8.1% in 2008 and another 5.5% in 2009. "It's a cautious uptrend," says Hambrusch. At some schools, the surge in interest is even more pronounced: applications to UIUC's CS program were up by 26% this year and increased by 32% at CMU.

The troubled economy has played a role in the uptick. Though the computing industry experienced a wave of layoffs at the height of the recession, it has been hit less hard than other sectors, and employment was up by an estimated 5% in the second quarter of 2010.

The Coolness Factor

According to a recent study conducted by the National Association of Colleges and Employers, the average salary for this year's crop of computer science grads stands at \$61,112. And while it's too early to say for sure, some industry watchers predict an influx of students who might otherwise have majored in finance. Harsha, for example, cites David E. Shaw, a computer scientist turned hedge fund manager who made a fortune in quantitative trading, then returned to scientific research: "He's a model for a certain group."

There is also a coolness factor among a generation of students who grew up with computers and are deeply engaged with technologies like cellphones, Facebook and other social media, and the latest electronic devices from Apple and



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other hardware companies. “For every popular trend in computing there’s a spike in interest,” says Harsha, citing a similar boom-and-bust cycle that happened with the rise of the personal computer during the mid-1980s. Also, Harsha says, students may finally have realized that the stereotype of computing as a lonely career in which you sit in a cube and write code is not true.

“We all owe a non-trivial debt to companies like Google and Apple, who do cool work on cool products and don’t look like your stereotypical guys in flannel suits,” says Lenny Pitt, a UIUC computer science professor.

Mark Stehlik, assistant dean for undergraduate education at CMU’s School of Computer Science, has a different historical comparison: the space program of the 1960s, which fueled the imaginations and ambitions of a generation of schoolchildren. “There was such an enterprise built around it,” he recalls. Of course, to go to the moon, you had to be a rocket scientist. “And what if rocket science wasn’t your thing?” Computer science majors, on the other hand, have a variety of career options to choose from once they graduate. “You can do software development across such a wide range of sectors,” notes Stehlik, as nowadays almost every industry has computing needs.

In spite of recent gains, the supply of CS graduates is still dwarfed by the projected number of jobs. According to the BLS projections, there will be more than twice as many new computing jobs per annum in the next eight years than the current level of 50,000 computing graduates will be able to fill. Nor can computer science departments, many of whom had trouble dealing with the influx of students in the late 1990s,

Software engineering alone is expected to add nearly 300,000 jobs in the U.S. in the next eight years.

expand as quickly as companies and universities might like. “We currently have about 775 undergrads, and we can add another couple hundred without a problem,” says UIUC’s Rutenbar. “But we need to do some soul searching if we want to grow larger than that.”

The International Outlook

The job prospects for computer science graduates in the United Kingdom, China, and India vary widely as does each country’s educational and economic situations.

According to the United Kingdom’s Higher Education Statistics Agency (HESA), 17% of 2009’s CS graduates were unemployed six months later—more than any other discipline. Industry watchers caution that the figure should be taken with a grain of salt, however, since the category includes students who studied softer subjects like human-computer interaction and information development as well as traditional CS majors. “Higher-level things like software and systems design are a different picture,” says Bill Mitchell, director of the British Computer Society. “They are very much recruiting these types of people.”

Research institutions like the University of Southampton, which placed 94% of its computer science graduates in 2009, echo Mitchell’s sentiment. “Companies still need people with really good skills, who have been exposed to different languages and platforms, who are confident and can code,” says Joyce Lewis, communications manager for the University of Southampton’s School of Electronics and Computer Science. And while the University of Southampton and other members of the Russell Group—an association of 20 universities that’s often referred to as the U.K.’s Ivy League—have no trouble filling spaces in their computer science programs, educators are nonetheless concerned by a massive nationwide drop in interest in the field. “Enrollment has dropped by nearly 60% over the past eight years,” says Mitchell, who is working to reform the national IT curriculum and reverse the trend. “Companies tell us they have to bring people in from Silicon Valley.”

Recent computer science graduates in China are also struggling with a demanding job market. According to a study conducted by the MyCOS Insti-

tute, a Beijing-based think tank, computer science, English, and law have topped a list of majors with the most unemployed graduates for the past three years. In 2009, the most recent year for which data is available, computer science was second only to English in the number of unemployed graduates.

Here, too, the figures underlie a more complicated picture. Thanks to governmental encouragement, the number of university graduates in China has risen dramatically during the past 10 years. In 2008, more than six million students graduated nationwide; in 2002, the total number was below 1.5 million. Such increases, education experts contend, were not matched with employment prospects, particularly in technical fields, where market needs are highly specialized. Therefore, students must work hard to distinguish themselves from a glut of applicants. Often, that means earning a graduate degree. “Companies get a lot of applicants, and to make it easier, some use the degree as a filter,” says Xiaoge Wang, an associate professor in the department of computer science and technology at Tsinghua University. At Tsinghua, 83% of 2009’s computer science graduates enrolled in graduate programs at home or abroad, up from 78% in 2008 and 66% in 2007. “Our students would like to go to companies like Microsoft or IBM, which require a Ph.D. or a master’s,” says Wang.

In India, the IT industry is doing well after a slowdown brought on by the global downturn. According to

One concern in India is the growing lack of educators to teach the next generation of software engineers—a shortage of up to 70,000 teachers, according to some estimates.

the country’s National Association of Software and Services Companies, the IT services sector, still the dominant source of computing jobs, grew nearly 16.5% in 2009, and software exports are expected to increase by 14.4% in the current fiscal year. Job placements at the country’s top engineering schools are robust, with many students receiving multiple offers upon graduation. One concern, however, is the growing lack of educators to teach the next generation of software engineers—a shortage of up to 70,000 teachers, according to some estimates. University pay scales are low compared to the private sector, and few students pursue the advanced degrees that would qualify them for university positions. As a report published

in the *International Journal of Engineering Studies* explained, “The teaching load of professors in the top research-intensive schools has increased, and talented potential research students are being attracted by high-paying private-sector jobs, or by research opportunities at better-funded institutions abroad.” Those students who do pursue advanced degrees, according to the study’s authors, often do so to improve their market value in the job market. ■

Further Reading

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The IT-BPO Sector in India: Strategic Review 2009, <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=55816>.

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Universities & Colleges Admissions Service
Unistats From Universities and Colleges in the U.K., http://unistats.direct.gov.uk/retrieveColleges_en.do.

Zhang, M. and Virginia M.L.
Undergraduate computer science education in China, *Proceedings of the 41st ACM Technical Symposium on Computer Science Education*, March 10–13, 2010, Milwaukee, WI.

Leah Hoffmann is a Brooklyn, NY-based technology writer.

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Milestones

David Kuck Wins Ken Kennedy Award

David Kuck, an Intel Fellow, is the recipient of the second annual ACM-IEEE Computer Society Ken Kennedy Award for his four decades of contributions to compiler technology and parallel computing, which have improved the cost-effectiveness of multiprocessor computing.

In an email interview, Kuck discussed his current research. “I’m working on hardware/software codesign at a very comprehensive level, considering system cost, performance, and

operating cost (in terms of energy), as well as applications sensitivity. I’m working on theory and tools to support codesign. I introduced a computational capacity model in the 1970s and pushed it much further in the past few years. Measured bandwidth and capacity (bandwidth used) for a set of architectural nodes for each phase in a computation provide capacity ratios that are invariant across hardware changes. This leads to very fast simulations of

new machines, solving linear programming and related problems to satisfy design goals.”

Asked about the next important innovation with compilers, Kuck said, “Compiler optimization transformations are well developed, but where and how to apply them is still a mystery. I believe that building a large repository of codelets could remove much of the mystery related to sequential, vector, parallel, and energy-aware compilation. Many trade-offs

must be made, so a pre-analyzed repository would allow phases, and sequences of them, to be matched to codelets for optimal compilation. This is a combined static and dynamic approach to compilation.”

The Ken Kennedy Award recognizes substantial contributions to programmability and productivity in computing and substantial community service or mentoring contributions, and includes a \$5,000 honorarium.

—Jack Rosenberger

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**[In 2020] technology
will be more prevalent
in other parts of the
business and not just the
purview of IT.**

TIM FERRARELL, CIO, W.W. GRAINGER INC.



SPECIAL REPORT

When the cloud blots out the classic IT shop, only the tech-savvy business experts will weather the storm.

BY JULIA KING

.....

WELCOME TO the IT organization of the year 2020 — and brace yourself, because it's a far cry from the department you find yourself in today. Computer programmers have gone the way of the typing pool. So have one-dimensional technology

specialists like network engineers. Deeply technical professionals with multiple certifications in virtualization, networking and security technologies work primarily as component engineers and IT architects. Job titles include cloud architect, cloud capacity planner, cloud infrastructure administrator and integration architect.

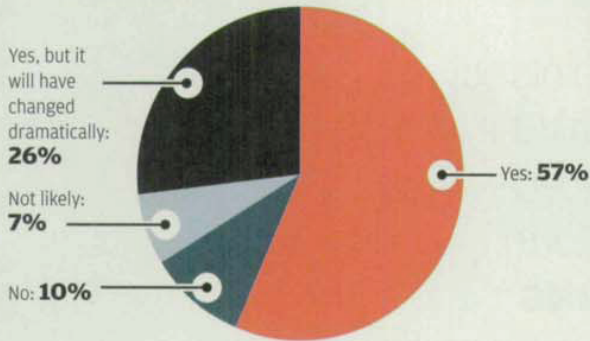
The people who work in these roles design and maintain the underlying framework or architecture. On top of this architecture sits a shifting inventory of cloud services, plug-and-play Web-based applications and easy-to-use proprietary software components that together represent the key source of a company's competitive advantage.

How these various components will be innovatively mixed and matched will largely be decided by marketing, supply chain and

IT Careers 2020

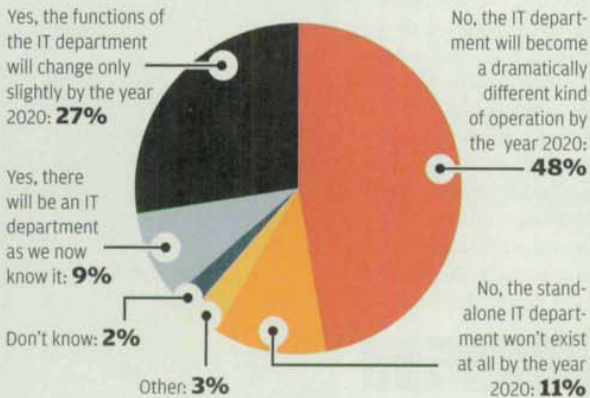
NEW ROLES

Do you think your current IT job function will exist in 2020?



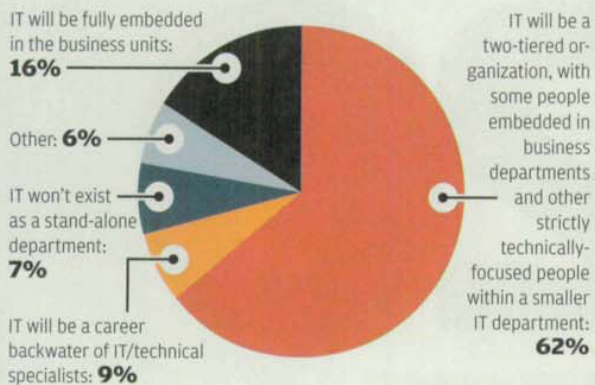
NEW SHOPS

In 2020, will there be a traditional IT department as we now know it?



NEW WORLD

What do you think the IT shop of 2020 will look like?



SOURCE: EXCLUSIVE COMPUTERWORLD SURVEY OF 465 IT PROFESSIONALS, JULY 2010

IT CAREERS 2020

You need to get skilled in emerging technologies and develop a deep technical skill set.

MARK O'GARA,
VICE PRESIDENT, HIGHMARK INC.



other business functions and divisions that will be guided by a second tier of IT professionals: super-IT-savvy business experts who reside in the business. They don't build software, but they work with the business to invent new products and services. They also assemble the software components needed to bring those offerings to market. They have titles like business systems analyst and business solutions consultant.

Sound far-fetched? It's only 2010, but already, the savviest companies are well along the path of implementing this kind of two-tiered IT workforce structure.

"2020 is already here," says Ian Patterson, CIO at St. Louis-based Scottrade. There, the IT organization includes project managers and business analysts with deep analytical and communication skills, and technical architects, who make sure "we don't step on ourselves by doing something that will negatively impact the business from a technology standpoint," Patterson says.

Going forward, CIOs and IT employment experts predict that this bifurcation of IT roles will vastly accelerate, with most professionals falling into one of two major categories: technical specialists and business specialists.

Tier 1: Tech Specialists

Technical specialists are the people who work in a centralized IT or business services organization. If you want to work here, you need to know about data standards, information standards, virtualization, networks, mobile technology and IT architecture, among other things. "You need to get skilled in emerging technologies and develop a deep technical skill set," says Mark O'Gara, vice president of infrastructure at Highmark Inc., a health insurer in Harrisburg, Pa.


Overall, this organization will have far fewer people than today's IT department, but these workers will have an extremely rich set of technical skills, and they will understand precisely

Megatrends 2020

As IT operations become inextricably linked with business operations, it seems likely that whatever big trends affect the business will have ramifications for IT.

BUSINESS TREND	IT IMPLICATIONS
Big businesses will get bigger. Small businesses will survive. And midsize businesses will be squeezed out. Expect more mergers and acquisitions.	IT professionals will work for either very big companies or very small ones. And IT vendors will be either giants or boutiques.
Government regulations will take up a growing portion of management's time and effort.	Even more IT work will be devoted to regulatory compliance and audits.
Consumers will expect "social responsibility" from the companies they do business with.	IT professionals will need to help their employers meet consumer expectations for ethical behavior, honest accounting, privacy safeguards and green IT.
The product design and marketing cycle – from the time a product is invented to the time it's imitated – is shrinking rapidly.	IT shops, which are increasingly involved in new-product development, will need to help the company get products to market at warp speed.

SOURCES: BUSINESS TRENDS ADAPTED FROM A REPORT BY FORECASTING INTERNATIONAL LTD., EXCERPTED IN *THE FUTURIST* MAGAZINE (JULY-AUGUST 2010). IT IMPLICATIONS BY MITCH BETTS.

 MORE PREDICTIONS: <http://tinyurl.com/MB-IT-2020>

how their business makes and loses money and how all transactions flow through the enterprise.

This is where the enterprise's overall business process and technology architecture will be maintained. The infrastructure will be made up of multiple services furnished by a variety of outside suppliers, coupled with software components that were designed both externally and in-house and that are extremely intuitive and easy for various business functions to assemble and use competitively.

As business units put together these applications, "the critical role the IT department will play is ensuring that business value is not lost through fragmentation," says Andrew Morlet, global director of the strategy and transformation practice at IT consultancy Accenture PLC. "IT will play a central coordinating role that protects the interests of the entire enterprise over the divisions themselves."

Cummins Inc., a worldwide supplier of diesel engines that's based in Columbus, Ind., is in the process of completing a major

IT Job Seekers Need Not Apply

A S IT ROLES MOVE UP the value chain, companies like Johnson & Johnson, State Street, W.W. Grainger, General Mills and Xerox are looking to hire smart, tech-savvy, collaborative business professionals for 20- or 30-year multifaceted careers, not for IT jobs.

"I believe the idea of hiring people for a job is well past," says LaVerne Council, CIO at Johnson & Johnson. Instead, Council and other savvy IT and business leaders are more focused than ever on developing sophisticated job-rotation programs and flexible career paths that offer employees exposure and experience throughout the enterprise and significantly boost their opportunities to move up and branch out within the company over time.

"We have a talent management process where we help people coach their careers into various different roles – business to IT, and IT to the business. But we do it as well within IT, from infrastructure to applications to change management and to all of the other various functions within IT," says W.W. Grainger CIO Tim Ferrarell.

So far, it's a strategy that appears to be working. Ferrarell, for example, started out at Grainger in merchandising and product management, then progressed through marketing and strategy before moving to IT seven years ago. Grainger's CEO, Jim Ryan, is a former CIO.

At Xerox Corp., the trend is similar. The executive driving Xerox's transformation from a hardware vendor to a services provider is a former applications portfolio manager. The former head of IT architecture has moved over to take charge of the company's global supply chain.

"The movement of talent between organizations is at the most senior levels and pretty significant," says Xerox CIO John McDermott. "The previously impenetrable wall between IT and the business became permeable."

At General Mills Inc., the career strategy revolves around hiring the best and the brightest and then keeping them engaged and challenged enough to want to spend the rest of their careers with the \$14.8 billion company. The average tenure at General Mills is about 13 years for an IT staffer and 16 years for an IT manager. Turnover is below the industry average of 5%. Also notable is that more than 15% of the company's IT staffers hold MBAs.

"Having an MBA is something we value because of our business process focus. The main focus is on the business and always has been," says Mike Martiny, vice president of information systems at General Mills. Still, he adds, "the starting point for everything is technical competency. There's time to grow everything else."

"With the growing importance of architecture, companies realize how valuable highly tenured people are," says State Street CIO Chris Perretta. "We're desperately looking for ways to attract people who are talented and want to stay for the long term. When we hire someone, we really want to hire them with the mind-set of belonging to the organization."

— JULIA KING

The Rise of the Chief Architect

BUSINESS PROCESS FRAMEWORKS, enterprise road maps, end-to-end operations and centralized architecture: Savvy CIOs use terms like those a lot these days. They all refer to an enterprise's highly complex yet continually tweaked and modified processes and their IT blueprints for doing business and turning a profit. In many cases, they represent the very source of a company's competitive advantage.

Developing these blueprints and then ensuring that various business units and divisions sprawled about the globe operate in sync with them is the increasingly critical role of the chief architect.

"Architects are really important, and they're going to be growing in importance," says Brian Cobb, senior vice president of mortgage operations and former vice president of technology infrastructure and operations at Fannie Mae.

Cobb and his team have spent 18 months re-engineering business processes at the government-sponsored enterprise and developing what he calls an "enterprise reference model" on which to run a more flexible and responsive business. "Now we're building against that architecture, which is a key tool to compete in the current economic environment," he says.

Xerox Corp. CIO John McDermott describes the role of chief architect as "the hardest job in any IT organization."

"The most difficult set of skills to recruit are blindingly brilliant IT architects," McDermott says. "It's an almost impossible job because of the scope of process knowledge you need to possess and the scope of [technical] knowledge you need on how to enable that process architecture."

At Xerox, the role is filled not by a single person, but rather in a center of excellence "where we combine and collocate business process owners with technology platform owners. That makes the challenge more manageable," he says.

Cummins CIO Bruce Carver says his company "has just made a fairly sizable investment in the architecture function." The reason, says Carver: "It's central to our success."

The diesel engine maker's goal is to streamline operations by, among other things, leveraging the same fundamental business rules and technology across its various divisions and business units, which span 70 countries. At the same time, Cummins is dispersing more and more technology-savvy business experts into various business functions.

The upshot: "As we start to have more technology-savvy people in the organization, they'll go off and convince business leaders that they need a solution, and at the end of the day, it will drive up costs and we'll have incompatibility issues," says Carver. This, he says, is where the chief architect plays a critical role in building or buying any and all technology so that it fits into the overall blueprint.

At State Street, the architect role is so important that CIO Chris Perretta elevated the position to report directly to him.

"The reason and the fact of the matter is that how we build things matters," he says. "It's not just an intellectual exercise. It has a material impact on the performance of the organization."

— JULIA KING

Ten years from now,
it will be all about how
to assemble software,
not how to build it.

KEN SPANGLER,
CIO, FEDEX GROUND



restructuring of IT. CIO Bruce Carver estimates that in the end, "only about 5% of IT roles will be purely IT, and these roles will be few and far between."

Cummins' centralized IT department is staffed by technical experts charged with creating standards and structure and managing the overall cost of the IT function. This is the home of the IT architecture group — and architect is fast becoming the hottest role in IT (see story at left). Another services and support group is made up of third-party service providers and a limited number of Cummins employees. All other employees are business specialists in what Cummins calls "business-facing roles."

All indications are that by 2020, a big chunk of technical specialists' work will involve integrating a broader array of technologies and services into the overall enterprise infrastructure, CIOs say. That's why a broader set of networking, software, virtualization and other skills will be required.

This trend hasn't been lost on vendors like EMC Corp., which is developing a cloud certification to complement its storage certification. Additionally, EMC is working with its security division, RSA, and virtualization vendor VMware Inc. to develop multidisciplinary certifications for technical specialists, says Tom Clancy, vice president of education services and productivity at EMC.

Tier 2: Business Specialists

The work of business specialists is matching the right IT tool to the business need at hand. These are super-IT-savvy business experts who understand how the business works, how transactions flow, what makes and loses money for the company, and where and how technology can help or hinder the business.

As futurist and *Computerworld* columnist Thornton A. May sees it, this is where the upwardly mobile career action is, as well as the greatest coolness factor.

"IT's future revolves along three interrelated dimensions," May

says, all of which converge in this IT career track. Those dimensions are innovation, which he defines as the ability to convert ideas into money; business analytics, which involves operations research, data mining, data integration, reporting and statistics; and risk management, which requires a keen knowledge of business processes. This is one of the best areas to look for work if your job is being automated or outsourced. "Each of these critical disciplines promises good future career opportunities," May says.

Regarding educational degrees, May anticipates a new breed of sheepskin, one that reflects both business knowledge and statistical analysis expertise.

Business specialists will play a leading role in various business functions, performing work that today can often only be performed in IT," says Tim Ferrarell, CIO at Chicago-based industrial distributor W.W. Grainger Inc.

In 2020, "technology will be easier to use. Therefore, it will be more prevalent in other parts of the business and not just the purview of IT," says Ferrarell. "We're more and more attracting and rotating people through business and IT functions so people understand how technology can be used to serve customers better. It's about having employees who are versatile and who know various technologies and business processes. It makes us more flexible and reduces risks. Rotation creates versatility." (See story, page 17.)

Many CIOs share the view that the emerging job title of business specialist is an indication that IT roles are moving up the value chain.

"The IT role becomes much more about how to use technology to help the

business rather than how we provide the technology," says Ken Harris, CIO at Shaklee Corp., a nutritional products company in Pleasanton, Calif.

At Boston-based financial services company State Street Corp., CIO Chris Perretta says that with a two-tiered IT workforce, "there are opportunities for our IT personnel to take much more of a leadership position on how business processes are designed in the long term."

State Street is formally defining the skill sets it wants in its workforce, says Perretta. Architectural skills are absolutely critical, and for pure technologists, "there's an opportunity to go much deeper into technology." For those "with more of a business solutions bent, there is an opportunity to get upstream a lot farther," he says.

Harris puts it this way: "When IT people move out into the business, IT moves up the value chain," because it moves closer to the customer and closer to the revenue line. "Within the IT department, all the remaining IT roles require a higher level of proficiency," he says.

Ken Spangler, CIO at FedEx Ground, says his company has historically focused on the role of business specialists in managing large, complex projects. But going forward, it will further sharpen this focus, dedicating those experts to business functions so they can come up with technology solutions to business problems early on, before they have a chance to evolve into large projects.

"The transformation is well under way," he says. ♦

[TOUGH QUESTION #5]

HOW DOES AN ENTERTAINMENT GIANT CONTROL WEB 2.0 APPLICATION USAGE?

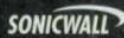


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Peering Into The Crystal Ball

Computerworld asked IT leaders across a wide swath of industries for their boldest predictions about the IT organization of 2020. Here's a sampling of their responses:

People who are purely involved in technology operations — the "run" part of the business — will be outsourced over time.

These are the people who will find jobs with service providers.

— **ANDREW MORLET**, global director, strategy and transformation practice, Accenture PLC

A lot more things that we do today inside the technology function will be able to be done outside the technology function. The real techies will go to the vendors and service providers.

— **TIM FERRARELL**, CIO, W.W. Grainger Inc.

The IT environment at user companies will shrink, and the new IT tasks will be much more aligned with using technology in the business rather than creating technology.

— **KEN HARRIS**, CIO, Shaklee Corp.

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Educational Master Plan
Information Submission Form

1) Title: Jobs for the Next Decade

2) Author: KATHLEEN LEIGHTON

3) Source: WOMEN IN BUSINESS MARCH 2010

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- Society
- Technology
- Economy
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- Education
- Other: _____

5) Relevance: Employment Trends

6) Page / Section: 8-9

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There is light on the employment horizon and women will fill half of the new jobs created.

Jobs *for the* next DECADE

WRITTEN BY KATHLEEN LEIGHTON

THERE HASN'T BEEN MUCH TO CHEER ABOUT ON THE JOB FRONT FOR QUITE A WHILE. Unemployment hovers in double digits as the economy sputters and stalls in the worst recession since the 1930s. In December alone, 85,000 jobs were lost in the United States. The jobless report released by the Labor Department in January showed that unemployment in this country is expected to remain high for the rest of this year, and possibly for the next few years.

But there is a light on the horizon, however dim it might be right now, as we look toward the next decade and what jobs it will bring. The numbers show that women will have a strong position in the employment ranks in the years to come.

According to the U.S. Bureau of Labor Statistics, women make up 46.5 percent of the labor force now, and that figure is expected to go up to 47 percent by 2016. Between now and 2016, women are projected to account for 49 percent of the increase in total labor force growth. In 2008, the most prevalent occupations for employed women were secretaries and administrative assistants, registered nurses, teachers, and cashiers. But the largest percentage of employed women worked in management, professional, and related occupations.

What does the future hold? All indicators point to women becoming a stronger force in the labor industry, with predicted job growth industries including IT and health care.

Health Care and Tech Jobs Rule

"The medical industry is a given," says Jacqueline Midkiff, a regional economist with the U.S. Bureau of Labor Statistics. "With an aging population, we will all need more medical care, and that has been shown in our occupational projections. All the medical-related fields are growing by leaps and bounds."

The fastest growing occupations are home health aides and personal home care aides, medical assistants, computer software engineers, and network systems analysts. The occupation expected to add the largest number of new jobs from 2008 to 2018 is registered nurses, which is largely made up of female workers.



At the Women's Employment Network in Kansas City, president Sherry Turner is working with her staff to prepare women to be ready for employment by knocking down any barriers that might exist between them and a good job.

"There might be a transportation problem or a childcare issue," Turner says. "Anything that would cause them not to accept a job, we try to solve. And I'm also seeing women become much more entrepreneurial to gain financial stability. Women are starting their own businesses at twice the rate of men."



The 10 Fastest Growing Job Opportunities

Biomedical engineers	72%
Network systems and data communication analysts	53.4%
Home health aides	50%
Personal and home care aides	46%
Financial examiners	41.2%
Medical scientists	40.4%
Physician's assistants	39%
Skin care specialists	37.9%
Biochemists and biophysicists	37.4%
Athletic trainers	37%

Source: U.S. Labor Department

What does the future hold? All indicators point to women becoming a stronger force in the labor industry.

Turner also sees a lot of "income patching," in which women create their own side businesses, along with full-time employment, to hone different skills or to create a more positive home revenue stream.

"Women no longer have to choose between being employed by someone else or being self-employed," Turner says. "Many of them are doing both. It's important to explore all your options and understand what your strongest skill sets are. Women have a lot more options now."

Still Fighting for Leadership Positions

While they may have more options, there's still a long road ahead. In many areas of the country, women still struggle to achieve equality in the workplace with male counterparts. A recent study at the University of Buffalo Regional Institute found that while women make up half the work force there, they comprise less than

half the leadership in work places. The study also found that women are over-represented in low-paying, traditional occupations, and they are barely represented in skilled trades such as carpentry or electrical work.

Still, there are opportunities in the near future for women to have influence in the labor market. Laura Johannesmeyer, the community career services coordinator at Johnson County Community College in Overland Park, Kan., sees green occupations and sustainability issues as hot job areas for the coming decade.

"I think the legal issues surrounding water will be a big issue in the next 10 years," she says. "I also see facility managers having an expanded role to include sustainability issues. Large corporations may add more staff to deal with upgrading facilities to meet new national green certification guidelines."

The best green jobs in the coming decade, according to the *Green Economy Post*, include conservation biologists, recyclers, urban planners, and energy efficiency builders.

So while the job landscape might look bleak today, all signs point to brighter days ahead—and more advancement opportunities for women in the work force. [in](#)

Kathleen Leighton is the force behind Leighton Communications in Kansas City.

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Recruiters: IT job prospects are better than you think

Though outsourcing, offshoring continue to **change the game**

BY CAROLYN DUFFY MARSAN

Will there be a jobless recovery for IT in 2011? That's the most important career-related issue facing IT executives today, as they make staffing decisions for next year while also worrying about their own job prospects amid a steady stream of corporate downsizing and offshoring announcements.

Ask any IT pro who is out of work right now, and the answer to this question is a resounding yes. They'll point out that more IT infrastructure and support jobs are being outsourced, and that it's harder than ever to find full-time employment. Talk to recruiters and placement firms, and a different picture emerges. They report a rise in corporate IT shops looking to hire application developers, project managers and mobile device experts — if not on a full-time basis, then at least for short-term projects. We polled five experts in IT hiring trends, and here's what they had to say about tech job prospects for 2011.



Yes,

THERE IS A JOBLESS RECOVERY FOR IT

Jerry Luftman, a distinguished professor at Stevens Institute of Technology in Hoboken, N.J., says that by definition we are in a jobless recovery in the United States.

"The economic gods in Washington have declared that the recession has been over since the summer of 2009, but we also know that the job situation has not been very good," Luftman says. "If we look at the next year or two, it will probably remain a jobless recovery."

Nonetheless, Luftman predicts that IT professionals — entry-level and experienced — will have better job prospects in the coming year than other types of professionals.

"The use of IT is expanding everywhere," Luftman says. "There isn't an industry, there isn't a part of an industry, that doesn't see new and innovative opportunities to leverage IT. Whether it's in changing infrastructure, considering going to a virtualization or cloud computing, or whether it's new, innovative applications that leverage business

intelligence or [customer relationship management], the opportunities are growing."

Luftman sees job opportunities growing not only with emerging technologies but also in support of legacy systems. In particular, he sees rising demand for IT professionals with experience in Cobol, IBM's CICS transaction systems and IBM's IMS database management system.

"As the baby boomers start to retire, there's going to be a huge gap in the number of IT people with experience in legacy systems," Luftman says. "The biggest companies still have a significant amount of their production environments running on legacy systems ... and as boomers retire, they aren't going to have enough people to backfill these jobs."

It's possible that support for legacy systems will go offshore. In a recent survey of CIOs that he conducted for the Society for Information Management (SIM), Luftman found that offshore outsourcing is expected

to increase from 5% of IT budgets in 2010 to 7% of IT budgets next year.

"That's a big jump," Luftman says. "I think part of it is that organizations are not finding the talent they are looking for and are willing to go offshore ... There are Cobol people in India, and they are ready to support a legacy application."

Luftman advises IT professionals to build up technical skills in such areas as business intelligence, virtualization, cloud computing, enterprise resource planning and information security, because that's where he sees the most demand in coming years.

But Luftman also points out that in year after year of surveys he conducts, CIOs continue to emphasize business skills over technical skills.

"They're looking for management skills, industry-specific skills, communications skills, marketing skills, presentation skills and negotiation skills," Luftman said. "These are all just as important as companies look to hire people."

IT hiring remains sluggish because of outsourcing and offshoring, asserts Janco Associates, a Park City, Utah-based consulting firm. The firm reported that total employment in IT rose only 0.17% in November 2010

compared to a year ago.

"It is a jobless recovery for IT because of two things," explains Janco Associates CEO Victor Janulaitis. "IT organizations are not in a hiring mode ... and we have companies outsourcing a lot of lower-level and entry-level jobs. Unless you're somebody who has prior experience or lots of contacts, it's very, very difficult to find a job."

Janulaitis says companies are outsourcing more technical work, in such areas as managed IP services such as VoIP and VPNs. In addition, companies are hiring contractors for desktop, helpdesk and security services, and they are preparing to put more applications in cloud computing environments.

"It's the grimmest of the grim for telecom and network infrastructure specialists," Janulaitis says. "This is an area that people have outsourced or eliminated in a lot of organizations."

One bright spot that Janulaitis sees is increasing demand for experienced application developers.

"If you can develop applications with HTML5, if you know how to integrate data and create customer service applications, those skills are in demand," Janulaitis says. "The skills that are not in demand are running a data center, running a communications center or running a help desk."

Janulaitis sees continued demand for IT people with business skills, such as project management and risk management. He also sees job opportunities with contractors and for hourly or project-based work.

"A lot of organizations are still on hold. They're not going to hire anybody. They're not going to add IT capabilities unless it creates additional revenue or improves productivity," Janulaitis says. "The issue I think for people who are out of work is that the likelihood of them finding full-time employment is very, very slim. The likelihood of finding part-time work is greater."

No,

THERE IS NOT A JOBLESS RECOVERY FOR IT
Outplacement leader Challenger, Gray & Christmas has issued some of the gloomiest U.S. unemployment reports in recent months. Yet, CEO John Challenger is optimistic about the tech sector's prospects in 2011.

"Tech is doing better than the rest of the economy," Challenger says. "For many other sectors in the economy, the tech spend is up. They have a lot of cash on their balance sheets and on their books, and they can start investing back in themselves after two or three years of being in survival mode. They've let their tech investments lapse, so

they're starting to spend more again, which means newer systems and newer technology. And they need people to bring it up and integrate it and solve issues that come up. That's creating more demand for tech workers."

Challenger says he is seeing companies grow their IT workforces, and that they're looking for experts who can integrate the latest technologies — particularly mobile devices and applications — into the enterprise.

The hottest skills in demand are "what is new," Challenger says. "Tech workers have to constantly keep learning the new technology and help companies utilize it."

Challenger has a positive outlook for tech despite heavy job cuts reported in November. The outplacement firm said U.S. companies announced plans to reduce their payrolls by 48,711 jobs in November, the highest level in eight months.

Nonetheless, Challenger, Gray & Christmas points out that employers have announced 60% less job cuts in 2010 compared to 2009: roughly 500,000 compared to 1.2 million a year ago.

The biggest cuts right now are occurring in state and local government agencies and non-profit organizations, and that's expected to continue in 2011.

"The private sector went into this recession from a job standpoint in 2008 and 2009," Challenger says. "The government is just going into this recession now from a job standpoint, and who knows how long that will last."

Challenger points out that it's been a rocky recovery in 2010, but that he feels that the economy is picking up steam. His biggest worry is that the unemployment rate is still hovering around 9% nationwide.

"There are a lot of people out of work ... That's one of the most stubborn and difficult after-effects of this recession that has occurred, and that's making recovery suspect," Challenger says. "As more jobs are created, more people will try to get back in the workforce, which is another thing that will keep the unemployment rate high."

One indicator that IT unemployment rates are headed down is the growing placement of part-time and project-based workers.

Technisource, a leading IT temp placement firm, reports a 15% rise in corporate use of contingent IT workers compared to a year ago. Additionally, Technisource has seen its revenues related to temp-to-permanent placement of IT workers rise 50% in the last six months.

"We are very bullish for 2011 in the IT industry," says Michael Winwood, president of Technisource. "The use of IT contingent workers and contractors is up, and we're also seeing the permanent placement side of the market pick up the second half of the year. We



The biggest cuts right now are occurring in state and local government agencies and non-profit organizations.

see confidence [among IT executives]."

Winwood sees the most demand for programming and project management skills. In programming, he sees interest in the emerging HTML5 standard as well as standbys such as Java and WebSphere.

"We see a lot of capital expenditure being unleashed on new application development, application consolidation and infrastructure," he says. "We see two different types of project managers in demand: one project manager that can oversee a lot of the new application work, and as we move toward cloud computing, another kind of project manager that understands that world."

One shift that Winwood expects to drive corporate IT investment is the upgrade to Windows 7. He predicts that recently merged companies — particularly in the financial services sector — will use the upgrade to Windows 7 as an excuse to streamline their applications portfolios.

"Many of our clients have held up and are still running on the Windows XP platform," he says. "Now we see a wave of interest in the Windows 7 arena, not just in infrastructure and operating systems but also in applications."

Winwood says entry-level IT workers should look for opportunities at service desks as a way of gaining experience, while experienced IT staff should tout their project management and business analytical skills.

"We see very healthy demand from a client standpoint," Winwood sums up. "When I look to 2011 and 2012, my concern is more the supply of IT professionals versus the demand from clients."

Technology Web site Dice.com has hard numbers to back up its claim that there's no jobless recovery in IT. The Web site had more than 72,000 tech-related job postings in December 2010, an increase of 38% compared to a year ago.

"The general trend is up significantly," says Tom Silver, senior vice president of North America for Dice Holdings, Inc. "If there's a jobless recovery, that's not what we're seeing in tech."

Silver says job postings for two high-tech hot spots — Silicon Valley and New York City — are up 30% compared to a year ago. Another positive trend is that 60% of Dice.com's tech job listings are for full-time positions, compared to 57% a year ago. ■

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Educational Master Plan
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1) Title: Starting Salaries Down, But Hiring Up For Graduates

2) Author: _____

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At the managerial level, the survey showed that those with less than three years of experience actually are paid more, at \$93,250, compared with \$77,625 for those with three to six years of experience. This may be because executives are entering with higher existing salaries from other fields.

At seven to 10 years of experience, median compensation is \$94,500 and then \$132,000 for over 10 years, the survey said.

Purchase Information: Publishers Weekly's annual salary survey can be found on their web site at <http://www.publishersweekly.com>. Cost: free. Cost for annual subscription: \$249.99.

Starting Salaries Down, But Hiring Up For Graduates

Starting salary offers to graduates from the Class of 2010 are down compared to last year, according to the National Association of Colleges and Employers (NACE).

NACE's *Spring 2010 Salary Survey* says the overall average salary offer to a bachelor's degree candidate is \$47,673, which is 1.7 percent lower than the average of \$48,515 offered to Class of 2009 bachelor's degree candidates (See Table). At the same time, companies say they plan to hire 5.3 percent more graduates than last year, the first positive outlook since October 2008.

Selected data. Some majors fared better than others. Computer-related degrees are in particular

demand, the survey found. Starting salary offers leaped 5.8 percent to \$58,746. Computer science graduates saw offers jump 4.7 percent to \$60,426.

Offers for engineering graduates also increased, although in smaller increments. The average salary offer increased 1.2 percent to \$59,149. Electrical engineering grads saw the largest increase of the engineering disciplines, rising 3 percent to \$59,326, NACE said. The average offer for chemical engineering graduates is up 1.6 percent to \$66,437, and civil engineering grads saw a 1.3 percent increase in their average offer to \$52,443.

Computer engineering grads experienced just a 0.2 percent increase to \$61,121, according to the survey, NACE said. Mechanical engineering graduates received the same 0.2 percent increase, to bring their average salary offer to \$58,881.

Mixed results for business majors. The survey said the average offer to finance majors rose 1.6 percent to \$50,546, and the average offer to accounting majors crept up .04 percent to \$48,575. Marketing graduates' average salary offer declined 2.1 percent, to \$42,710. Business administration/management grads, however, saw starting salary offers plunge 8 percent to \$42,094.

Graduates with liberal arts degrees took an even bigger hit: average salary offers nosedived 8.9 percent to \$33,540, the survey found.

The Spring 2010 Salary Survey is available from NACE. Employers' final hiring projections also will be published this spring in the Job Outlook 2010 Spring Update.

Join NACE to receive the surveys or purchase a subscription. Contact: <http://www.nacweb.org>; 800-544-5272. Cost: \$400 for organizational membership, \$175 for individual membership, \$300 for a subscription without membership.

Average Starting Salary Offers for College Graduates, by Major

Major	Salary Offer	% Change from '09
Overall (all graduates)	47,673	-1.7
Computer (overall)	58,746	5.8
Computer science	60,426	4.7
Engineering (overall)	59,149	1.2
Electrical engineering	59,326	3
Chemical engineering	66,437	1.6
Civil engineering	52,443	1.3
Computer engineering	61,121	0.2
Mechanical engineering	58,881	0.2
Finance	50,546	1.6
Accounting	48,575	0.4
Business administration	42,094	-8
Marketing	42,710	-2.1
Liberal arts	33,540	-8.9

Source: NACE

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