

# The Economic & Workforce Development Opportunities of Green Technology

July 31, 2008



# Research Questions



- **What is Green Technology?**
- **What is driving the growth of Green Technology?**
- **How will the growth of Green Technology change the demand for workers in Orange County and Southern California?**
- **Identify occupations that will emerge and evolve due to the growth of green technology**

# What is Green Technology I



**Unlike a traditional industry cluster – Green Technology is identified not by a connected supply chain or by related industry classifications but rather the objectives of the products and services that are developed within this industry;**

- **Lowering greenhouse gas emissions,**
- **Increasing the efficient use of natural resources,**
- **Providing more sustainable development options, and**
- **Improving air and water quality**



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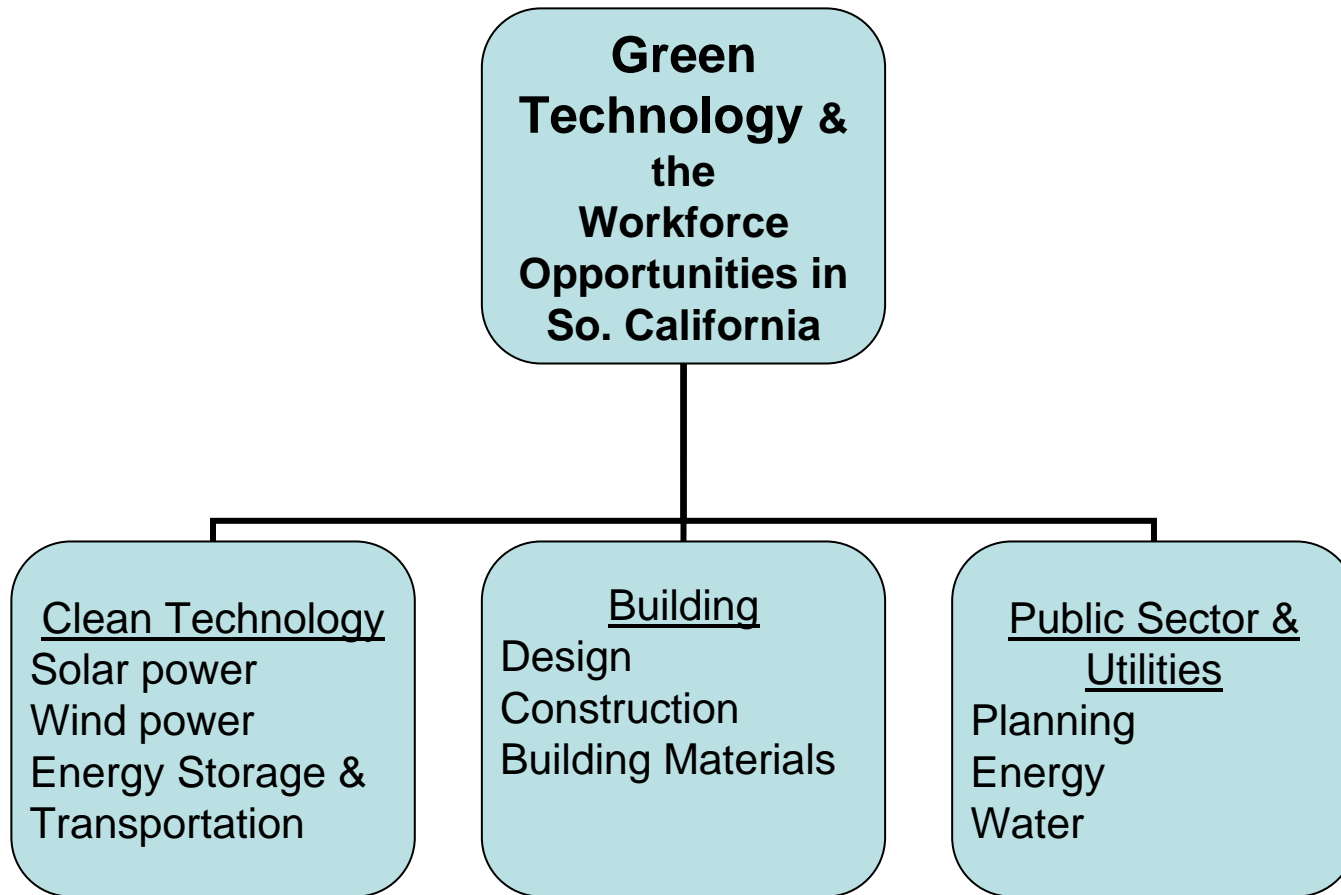
# What is Green Technology II



**From a workforce perspective Green Technology spans all levels of education and skill sets including those used for;**

- **Research & Development of alternative energies,**
- **Building new efficient homes and facilities, and**
- **Operating cleaner more efficient utilities**

# What is Green Technology III



# Growth of Green Technology



**Green Technology's growth is being driven by -**

- 1. Legislation and government policies providing incentives and requirements for cleaner development and green technology -**
- 2. Demand for sustainable energy sources & materials due to advances in technology and increased costs of traditional energy and commodities**
- 3. The opportunity for economic development and profit**



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# Growth of Green Technology - Legislation



**Green Technology's growth is being driven by legislation & government's commitment to sustainable development. Some examples include:**

- **AB 32: The Global Warming Solutions Act of 2006:** Mandates significant reductions in GHG emissions
- **AB 2021: Public Utilities & Energy Efficiency:** Requires utilities to identify cost-effective energy efficiency savings
- **AB 118 Low Carbon Fuels Fund:** Provides resources to develop a more efficient transportation infrastructure

## **Technology and increased costs have provided strong incentives for new energy, transportation, and building options**

1. Technology advances in nanotechnology and the material sciences are creating new possibilities for renewable energy and building materials
2. In the last 48 months, gas prices in California have doubled from about \$2.00 per gallon to over \$4.00
3. Traditional construction materials have gone up by 25% in the last three years



# Growth of Green Technology – Opportunity



**“For every \$100 million of VC dollars invested in clean technology, 2,500 jobs are directly created” –**

**-Nicholas Parker, CEO Cleantech Network**

From 2006 – to July of 2007 Los Angeles and Orange County has seen over \$320 million of VC dollars invested In local clean technology (Energy & Technology) firms.

- Energy Generation - \$222 million
- Energy Storage - \$40 million
- Transportation - \$26 million



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# Benefits of Green Building



- ***Environment*** – The creation & maintenance of buildings in CA is responsible for 35% of California’s GHG emissions. Green buildings will play a sizable role in meeting AB 32’s objectives for GHG emissions.
- ***Economy*** – The growth of Green Buildings provide opportunities for new industries to grow within the region, particularly manufacturing of green building materials
- ***Equity*** – Green Construction offers good wages and a strong career ladder without typically requiring a 4 year degree like comparable industries with similar wages and career opportunities.

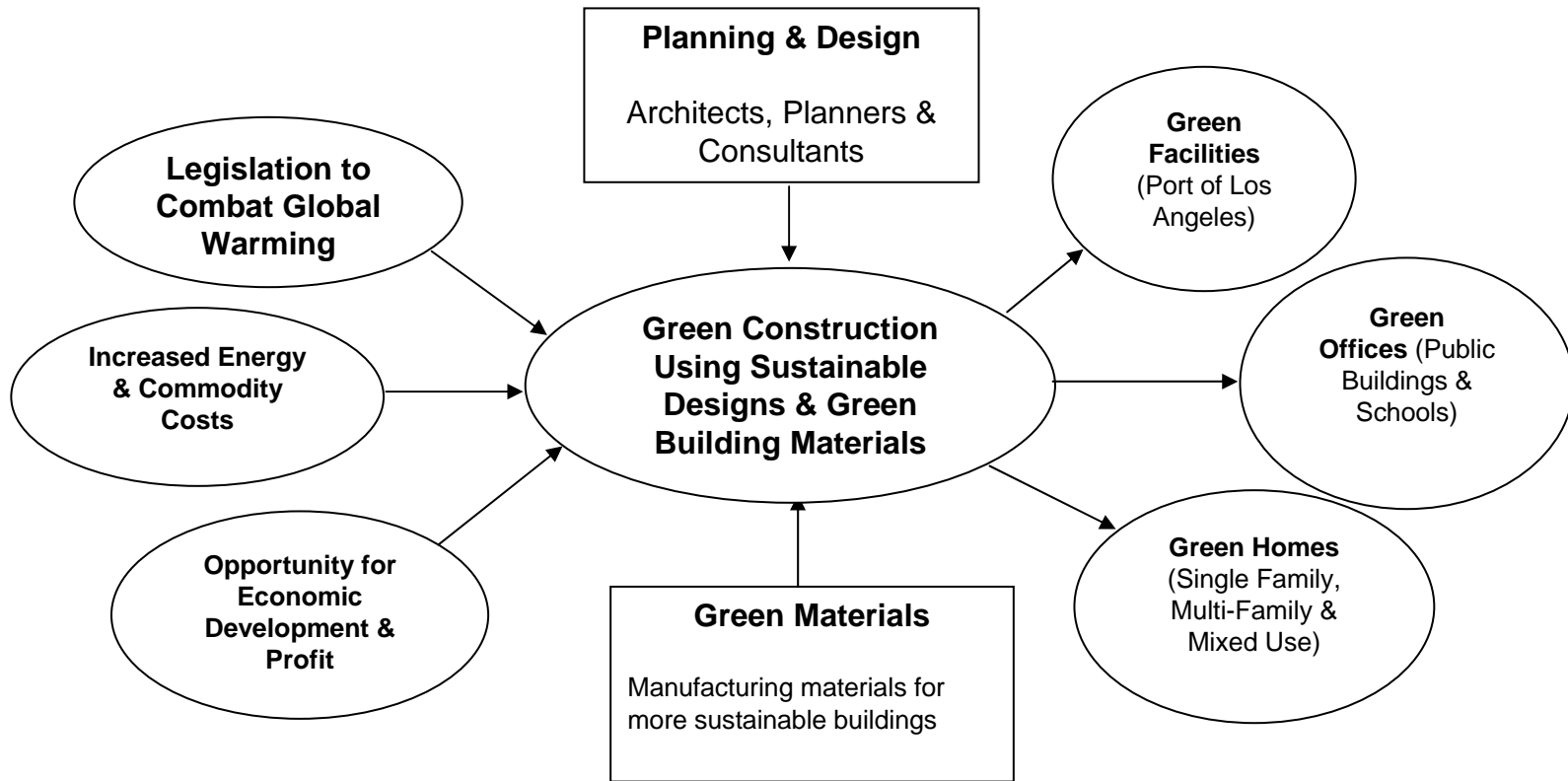
# Green Building in Los Angeles



**Green building is defined as an organized effort to design, Construct and maintain buildings and facilities using Processes and materials which promote sustainability.**

- In LA, Green Construction (GC) firms make up about 28% of the construction industry
- GC firms expect to increase employment at more than twice the rate of all other construction firms
- More GC firms are experiencing difficulty finding and recruiting qualified entry-level employees (70%)

# Green Building in Los Angeles II



# Occupations in Green Building



## Emerging Green Construction Occupations

- **Solar Installer & Technician (electrician certification)**
- **Energy & Indoor Air Quality Auditor (B.A.)**
- **Deconstruction worker (entry-level, 2 week intensive OJT)**
- **Operations & Maintenance Technicians for HVAC and PV systems (Associates or Certification)**

# Clean Technology in Orange County & LA



**Clean Technology (Energy & Technology) is the least developed of the Green Technology sectors but provides the most dynamic opportunity for growth, while the firms are focused on technology, sustainability, and profitability.**

**This is where VC \$'s are currently being invested in Los Angeles and Orange County;**

- **Energy Generation - \$222 million**
- **Energy Storage - \$40 million**
- **Transportation - \$26 million**
- **Water & Wastewater - \$16 million**
- **Energy Infrastructure - \$15 million**

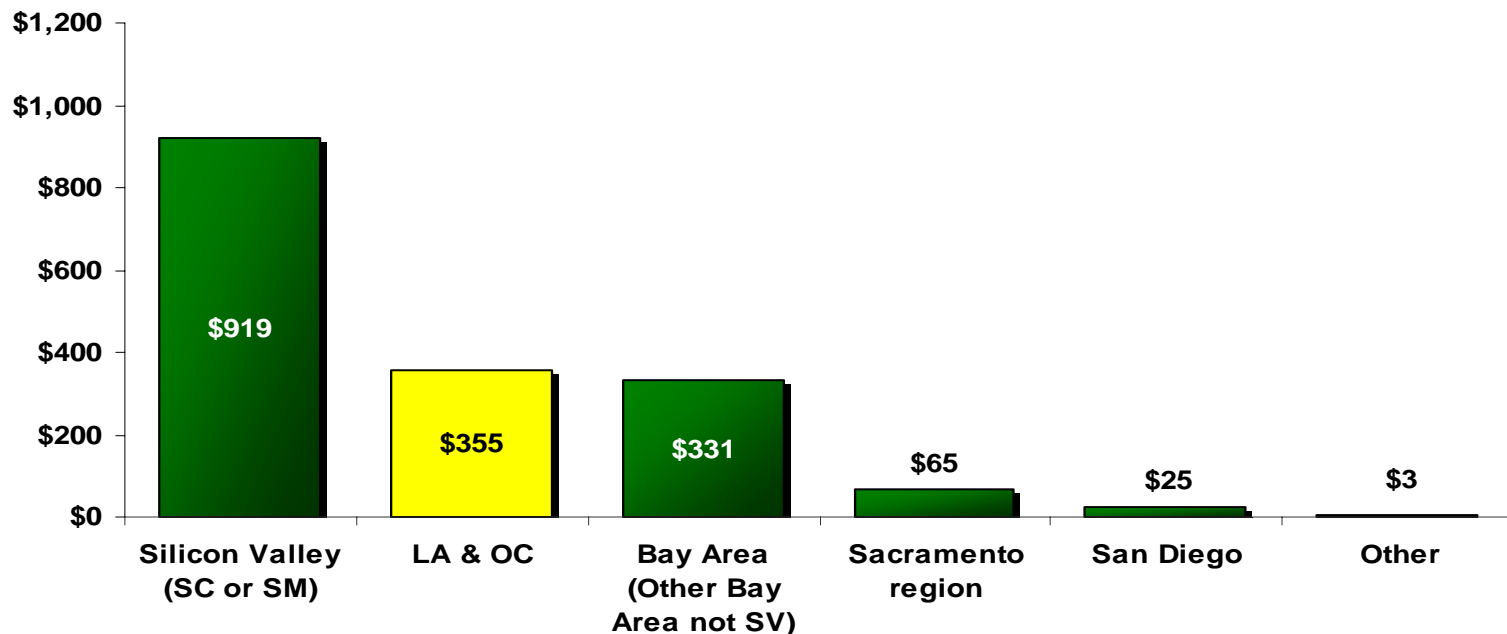


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# Clean Technology Venture Capital in LA & OC



In 2007, over 90 percent of VC investments in clean technology in California were invested in a firm that was located or headquartered in one of three regions



Source: Cleantech Network, Jan. 2008

\$'s in Millions



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# Clean Technology Employers



- **3 out of 4 CT employers will increase their number of permanent employees and total employment will increase by about 25 percent in the next 12 months**
- **Over half of CT employers indicated they would have at least some change (40%) if not substantial changes (26%) in the composition of their workforce in next 24 months**
- **60 percent of employers indicated they were having at least some difficulty if not great difficulty recruiting qualified applicants, either entry-level or non entry-level**

Source: LA/OC Regional Consortium & LATTTC, BW Research CT Survey, December 2007



**The Solar industry is one of the largest component in Energy Generation. A recent assessment of Solar's current and future workforce in California and Silicon Valley revealed-**

- Currently the Solar Industry in California expects to add 5,000 new jobs in the next 12 months, with employment growth at 30 to 40 percent for the next few years**
- By 2017, Silicon Valley expects to add 10,000 to 20,000 solar workers – 60% manufacturing & installation, 20% sales & marketing, and 20 percent in engineering**

Source: COE Environmental Scan, Solar Industry, June 2008

Source: Solartech White Paper, June 2007

# Occupations in Clean Technology



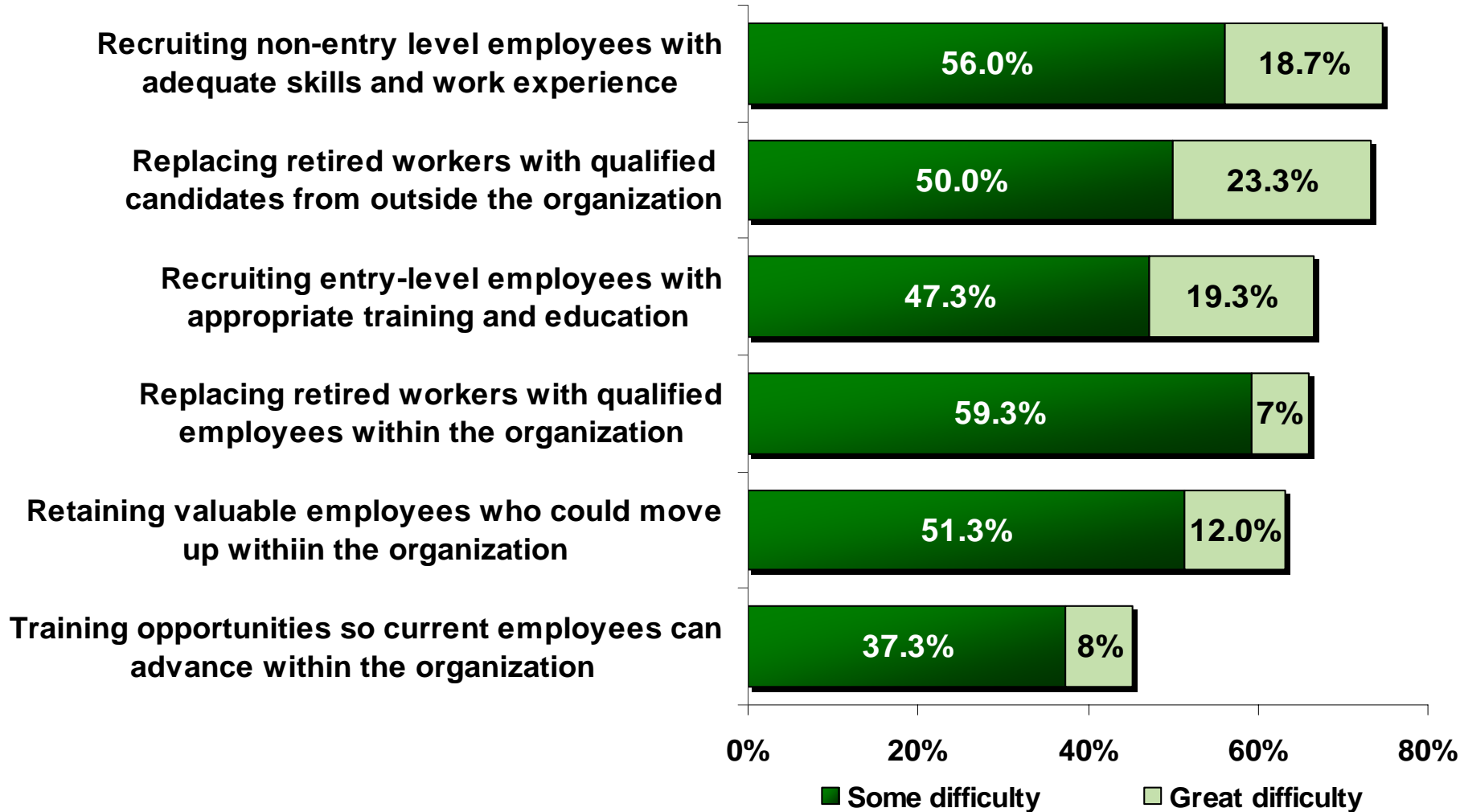
## Emerging Occupations in Clean Technology

- **Systems Technician (Associates or B.A.)**
- **Energy Auditor (B.A. or Associates)**
- **Compliance Specialist**
- **Resource Conservation/Efficiency Manager**
- **Energy Analyst (B.A.)**

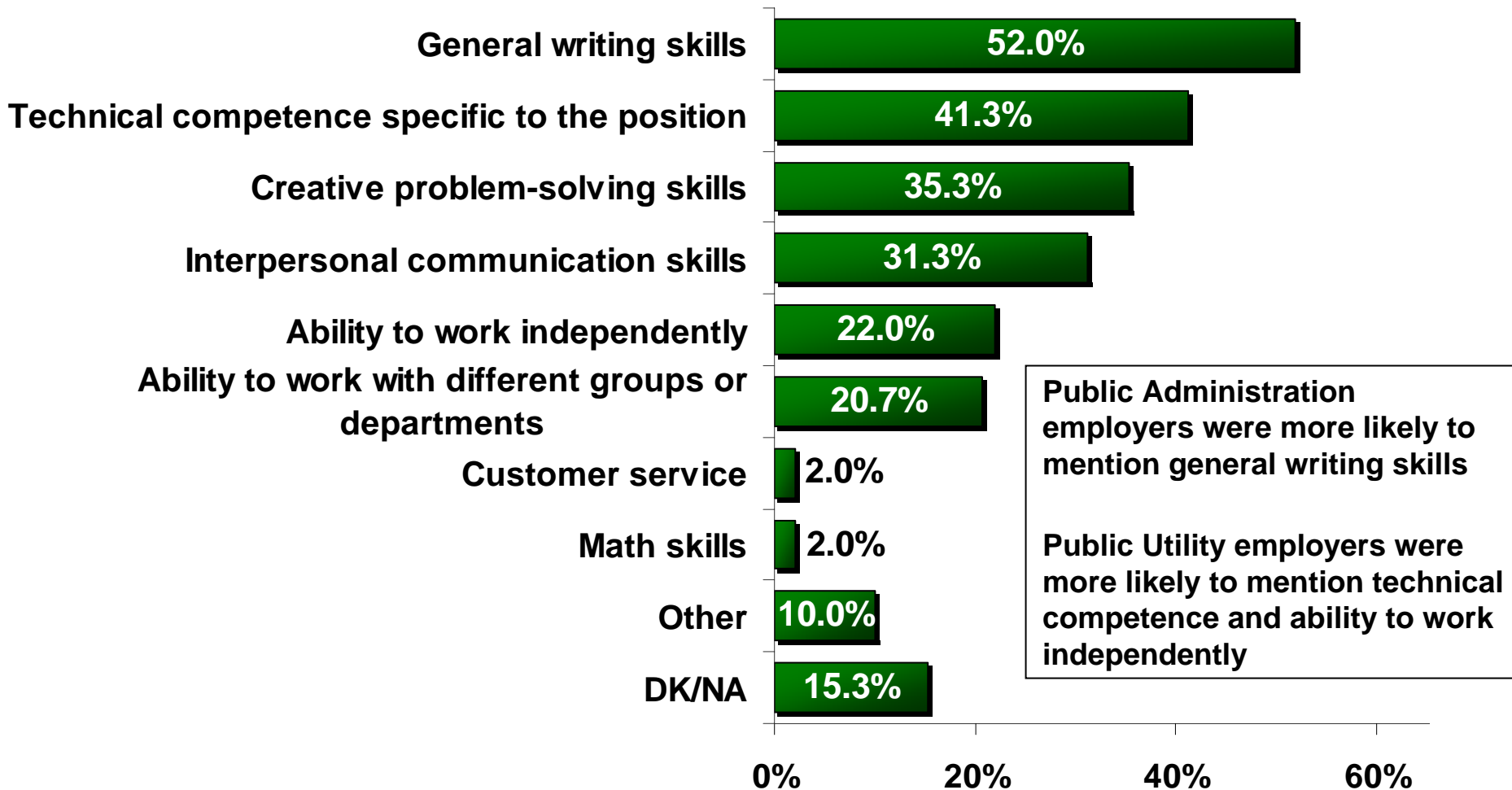


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# Workforce Challenges – Public Sector



# Recent Hires: General Skill Deficiencies



# Occupational Assessment Categories



<b>RED</b>	Occupations that provide the <b>STRONGEST</b> indication that they will be undersupplied in the future
<b>YELLOW</b>	Occupations that provide <b>SOME</b> indication that they will be undersupplied in the future
<b>GREEN</b>	Occupations that provide <b>LITTLE TO NO</b> indication that they will be undersupplied in the future

- Employer survey results: growth and difficulty hiring
- Projected job growth 2004 - 2014
- Projected replacements and separations

# Occupations Assessment



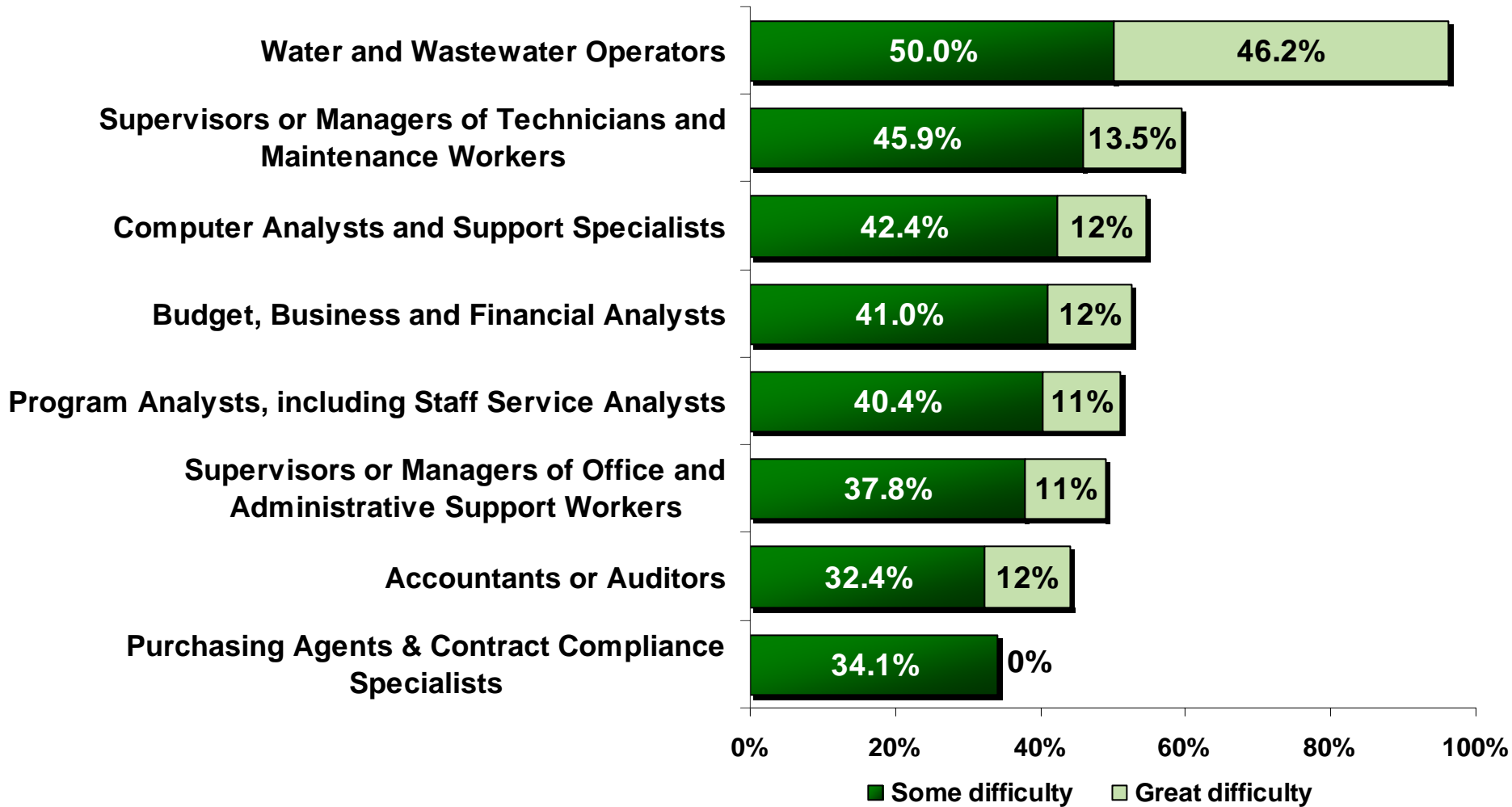
## RED OCCUPATIONS

- Water and Wastewater Operators
- Computer Analysts and Computer Support Specialists
- Supervisors/ Managers of Technicians & Maintenance Workers

## YELLOW OCCUPATIONS

- Program Analysts, including Staff Service Analysts
- Budget, Business and Financial Analysts
- Supervisors or Managers of Office and Admin. Support Workers
- Accountants or Auditors
- Power Plant Operators

# Difficulty Finding Qualified Applicants



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# Methodology



- Secondary Research
  - Cleantech Network, Deals Database (2006 & 2007)
  - Solartech White Paper, June 2007
  - ATEEC, Advanced Technology Environmental Education Center
  - CA Employment Development Department, LMID
  - Economy.com, detailed regional forecast for Los Angeles & Orange County
  - California Energy Commission, CA GhG Inventory 2006
- Primary Research, Quantitative
  - Phone Survey, Construction Employers (n=100), Los Angeles County, Conducted for LA Center of Excellence
  - Phone Survey, Public Sector & Utility Employers (n=150), Los Angeles & Orange County, Conducted for LAOC Regional Consortium
- Primary Research, Qualitative
  - Executive Interviews, Green Construction Employers, Industry Leaders, and Consultants
  - Executive Interviews, Public Sector Employers, Educators, and Trainers