

CH2M HILL Enterprise Management Solutions Solar Mapping Web Portal

Los Angeles Region Imagery Acquisition
Consortium2 (LAR-IAC2)



CH2M HILL – Full Service Engineering,
Construction and Operations

- **Founded in 1945. Employee owned. Named after the company founders**

- Offices World Wide, 26,000+ Consultants, \$6.5B Revenues
- Water Resources, Environmental, Transportation, Nuclear, Energy, International, Operation & Maintenance, Industrial, Life Science
- Sustainability Solutions Engineers

Example - Climate Change/Carbon Mining- Creating credible GHG management actions, Panama Cannel, 2012 London Olympics, Sandy Springs, GA

- **40 plus years of GIS, mapping and surveying work**

- World's Largest Spatial Solutions Consulting and Integration Firm
- Alliance relationships with Google, Microsoft, ESRI, Autodesk
- Develop leading-edge Spatial Solutions to enable Sustainable Energy Programs – Solar, Water, Wind, Other Renewable

Examples – Solar Mapping, Wind Farm Selection, Water Usage Tool for the World Business Council for Sustainable Development (WBCSD)



Our World Today



Annually, the United States of America generates:

- 71% of its electricity using fossil fuels
- emits 10.3 million tons of sulfur dioxide
- 22% of the worlds greenhouse gases
- 3.9 million tons of nitrogen oxides,
- 2.4 billion tons of carbon dioxide
- over 50 tons of mercury

US Gov. D.O.E Stat's 2006

- **Global Melting** -The flow of ice from glaciers in Greenland has more than doubled over the past decade.
- **Global Warming** - Over the last century the average temperature has climbed about 1 degree Fahrenheit around the world.

75% of emissions come from cities

50% of City emissions are generated by buildings

99.8% of buildings rely on emission producing electricity

its time to change.....



Wide-spread Adoption of Renewable Energy
is Part of the Answer

- **Education - Financial Incentives - Ease to Install - Participation**

- Using our Solar Automated Feature Extraction™ Methodology, CH2M HILL combines aerial imagery with 3D modeling technology that enables us to asses a square mile of rooftop Solar PV potential in aprox. 20 minutes – up to 75% faster than any other method.
- Displays amount of solar paneling that can be installed on structure's roof
- Displays the amount of solar energy generated by the sun based on structure location
- Calculates the electricity cost reduction resulting from panel installation
- Calculates reduction in carbon dioxide/greenhouse gas (CO2) emissions
- Displays state/local rebates as a result of solar panel investment
- Educates using case studies from those investing in solar panel technology
- Offers contact information for local solar panel system installers



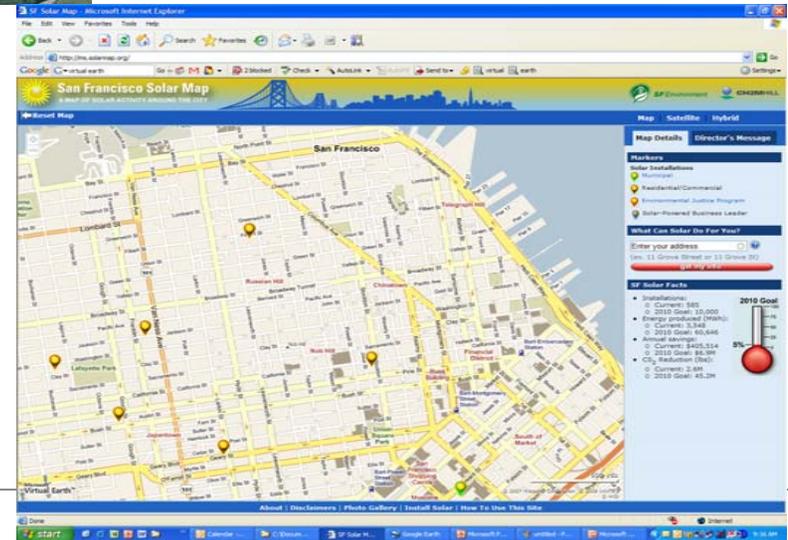


Significant Commercial and Financial Benefits

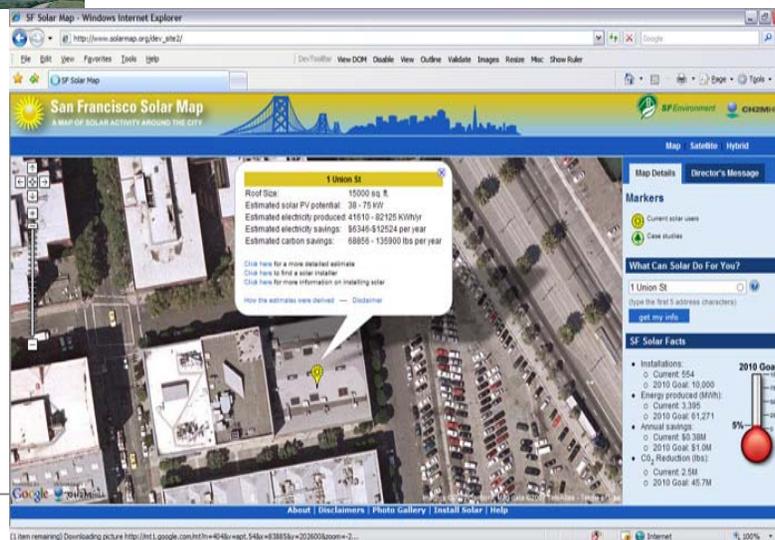
- Helps meet Renewable Energy Goals and Regulations
- Reduces fossil fuel energy consumption
- Encourages Economic Development
- Hot Topic – Great Public Relations
- Achieves health, humanitarian and environmental responsibilities
 - Particle omissions from fossil fuels kills around 30,000 Americans a year (Abt Survey for US Gov)
- Financial gain
 - Example - San Francisco has a target of 10,000 systems installed by 2010 – this would give an annual savings of \$7,003,454 & annual carbon savings of 45,709,332 lb's
- This is equivalent to:
 - Taking 3516 vehicle off the roads (average vehicle produces 13,000lb of CO₂ per year)
 - Turning off 332,431,505 hours of a 60W light bulb (60w light bulb = 3.3lb of CO₂ per 24 hours)



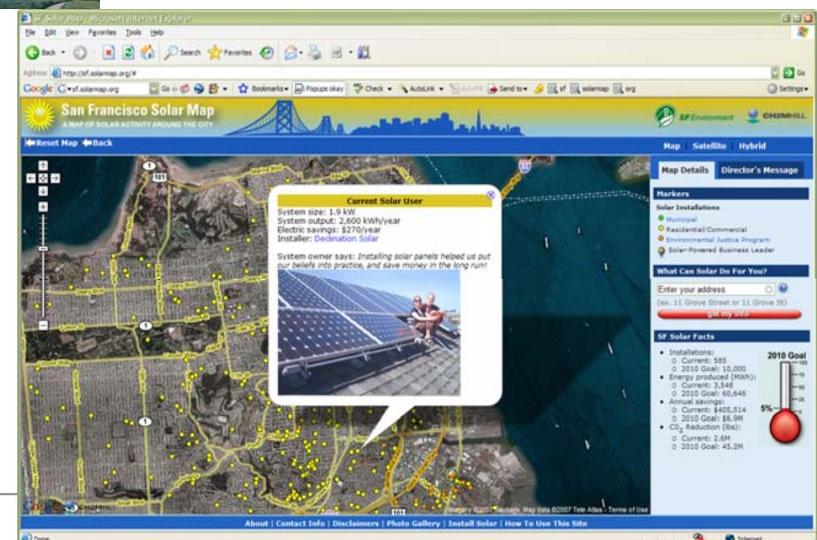
SF Solar Portal



View of Building Roof and Solar PV potential



View of Current Solar User





Additional Benefits of Solar Map

• Building Foot Prints

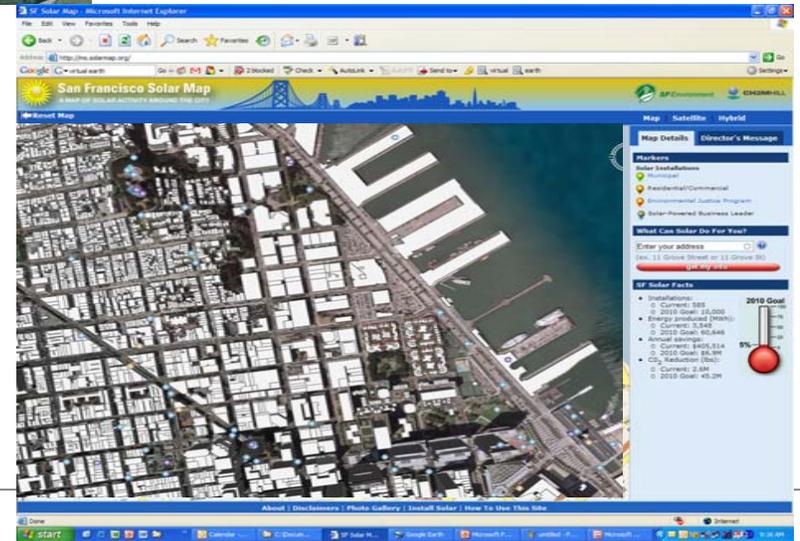
- Benefits
 - Emergency planning
 - Asset Tracking
 - Asset Management
 - Economic Planning

• 3D Models

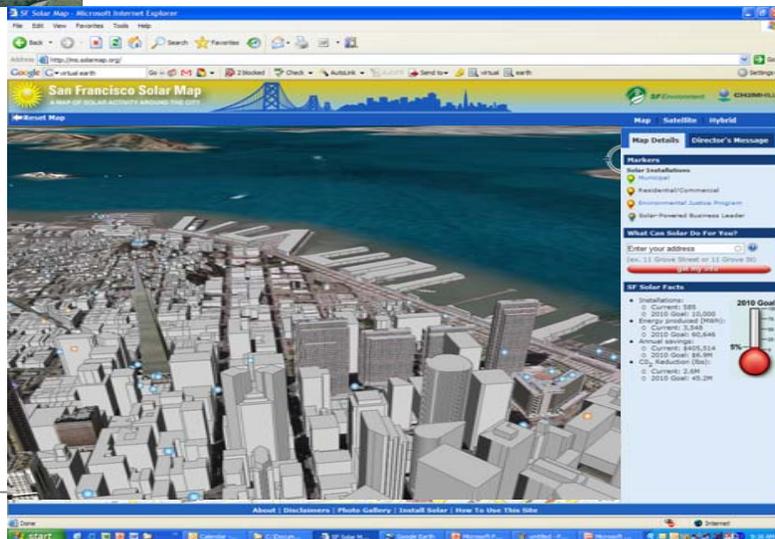
- Benefits
 - Emergency planning
 - Asset Tracking
 - Asset Management
 - Building load analysis
 - Conservation
 - Economic Planning



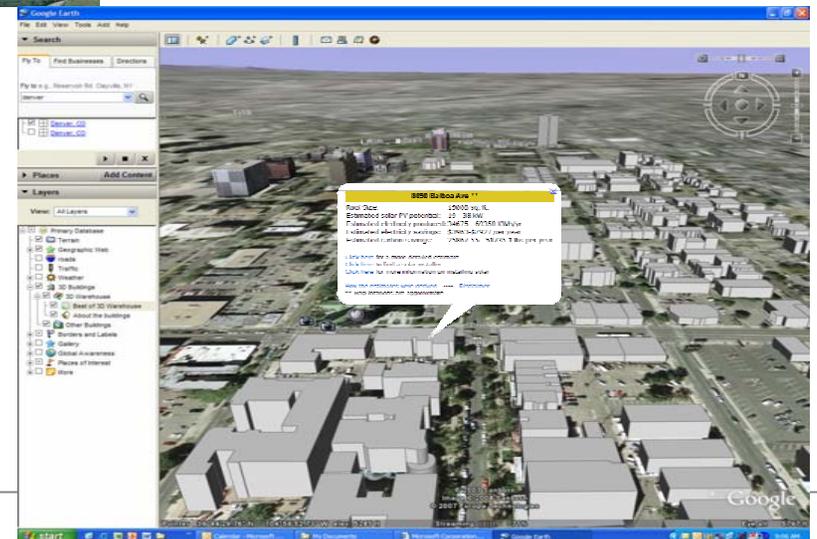
SF Building Foot Prints



SF 3D Buildings



View of 3D Buildings





Billing Statistics & Analysis Tool

Account Home
Update Account Information
Your Monthly Bill
Your Energy Usage
Optional Billing Services

Solar Site Analysis Tool

Name: Customer
Address: Street Address, City, State, Zip

You are currently receiving your bill electronically. Thank you for helping the environment.

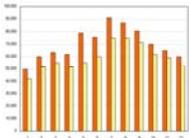
Your Building Information

Square Footage: 15,000
Useable Square Footage: 12,983
Roof Type: Tar and Gravel
Roof Tilt: 0
Roof Orientation: N/A
Building Age: 1978



Estimated Bill Impact

\$19,200/yr; \$1,600/mo



Net Monthly Bill Impact

Your Solar Potential (How was this calculated?)

80 kW

Projected System Costs (How was this calculated?)

\$640K

After Rebates (Click here for incentive information)

\$330K

Approximate Monthly Cost on 20Yr Term (How was this calculated?)

\$1,500K

More Information

PV Contractors | Environmental Impact | Detailed Economic Analysis | Rebates and Incentives | About Solar Energy



Benefits Analysis – Public Sector

- Option 1:
 - CH2M HILL Hosted
 - One single monthly cost (dependant on accuracy of existing data)
 - Create City Solar Mapping System
 - Build Portal
 - Integrate with City Website
 - Manage and Update
- Option 2:
 - Company Hosted
 - Standard consulting engagement
 - Create City System
 - Build Portal
 - Integrate with City Website
 - Annual Update/Maintenance



Benefits Analysis - Commercial

- Option 1: Develop Microsoft/Google based “intranet” Solar Map Portal
 - CH2M HILL Hosted or client hosted
 - Web based GIS
 - Maps all company buildings
 - Provides analysis of Solar PV potential
 - Enables site selection to fully benefit from Solar energy
 - Provides Government required auditable reports detailing renewable energy compliance
- Option 2: Full Solar Energy Implementation
 - All of option 1 plus
 - Full program management to install Solar PV
 - Site selection analysis to identify most suitable buildings
 - Solar panel manufacturer analysis and selection
 - Installation and contractor management
 - On going support, servicing and maintenance



Questions?

Anthony Palizzi
Client Solutions Director
Enterprise Management Solutions
anthony.palizzi@ch2m.com
720-308-0257

