

# BENNY BENSON, P.E. *President*

## PROFILE

Benny Benson is founder and president of ENERGYneering Solutions, Inc. (ESI). Prior to ESI's founding in 2007, Mr. Benson co-founded the SCS Energy division of SCS Engineers. He has been providing renewable energy solutions to the bio-fuels market for almost 20 years. His wide range of mechanical engineering experience includes: bio-fuel treatment and utilization, landfill and digester gas collection and control, digital control systems and data management services (SCADA), and other diverse solid waste projects.

## EDUCATION

BS, Mechanical Engineering / Computer Science, Colorado School of Mines, 1988

## PROFESSIONAL LICENSES

Professional Engineer – California (No. 32218), Oregon (No. 80443), Washington (No. 46558), Idaho (No. 13986), Virginia (No. 47154), Florida (No. 71765), Ohio (No. 74955), Pennsylvania (No. 078263), Missouri (No. 2011037416), Idaho (No. 13986).

Wonderware Control Systems Integrator, 1999  
 Emergency Medical Technician, 1990  
 OSHA-Certified Site Surveillance Technician, 1994  
 Private/Instrument Pilot (No. 3151758)

## AFFILIATIONS

American Society of Mechanical Engineers  
 Solid Waste Association of North America (LFGTE Vice Chair)  
 BioGas Trade Association (3520 Chairman)  
 Aircraft Owners and Pilot Association

## PROFESSIONAL EXPERIENCE

### BIO-FUEL UTILIZATION EXPERIENCE

#### *Fuel Supply*

- Landfill gas
- Digester gas

#### *Professional Service*

- Engineering and Design
- Construction Management
- Startup Assistance
- Operations

#### *Reciprocating Engine(s)*

- Caterpillar
- Jenbacher
- Deutz
- Cooper Superior
- Waukesha

### *Alternative Prime Mover Experience*

- Microturbines (Honeywell, Capstone, Ingersoll-Rand)
- Stirling Cycle Engines
- Fuel Cells

### LANDFILL AND DIGESTER GAS COLLECTION AND CONTROL SYSTEM EXPERIENCE

#### *Professional Service*

- Feasibility Studies
- System Design
- System Retrofits
- Construction Management
- End Use Coordination
- Operations and Monitoring
- Compression/Flare Station Specification and Design
- Compression System Skid Assembly



## PROFESSIONAL EXPERIENCE (continued)

### DIGITAL CONTROL SYSTEMS AND DATA MANAGEMENT SERVICES (SCADA)

#### EXPERIENCE

##### *System(s)*

- Power Generation Facilities
- Vapor Extraction Systems
- Wind Generation Systems
- Waste Water Treatment Facilities
- Bio-gas Treatment Systems

##### *Professional Service*

- Design
- Programming
- Operational Implementation

##### *System Features Provided*

- User Interface
- Centralized Networking
- Remote Operation
- Data Acquisition
- Reporting and Trending
- Operator Callout Systems

### OTHER SOLID WASTE EXPERIENCE

#### *Project Types*

- Material Recovery Facilities
- Composting Facilities
- Transfer Stations
- Rail Haul Studies
- Landfill cover design

## SAMPLE PROJECTS

### BIO-FUEL UTILIZATION PROJECTS (LANDFILL AND DIGESTER GAS)

#### *Reciprocating Engines*

- Finley Buttes, Boardman, OR / 3 CAT3520s, w/Heat Recovery
- Baseline, Ocala, FL / 2 CAT3520s
- Trinity Oaks, Dallas, TX / 2 CAT3520s
- Ostrom Road, Wheatland, CA / 1 CAT3520, Expandable
- Coffin Butte, Corvallis, OR / 2 CAT3520s, 3 CAT3516s
- Dry Creek, Medford, OR / 2 CAT3520s
- Weber County, Ogden, UT / 1 Jenbacher 320, Upgrade
- Penrose, Sun Valley, CA / Cooper Superior, Retrofit
- Toyon, Los Angeles, CA / Cooper Superior, Retrofit
- Pennsauken Landfill, PA / 4 CAT3516s
- Pacific Palms Hotel, Industry, CA / 2 Jenbacher 320, Natural gas blend, SCR, Heat Recovery
- Alza, Mountain View, CA / 3 Jenbacher 320s, Heat Recovery
- Bradley, Burbank, CA / 5 Deutz 620s
- Simi, Simi Valley, CA / 2 Deutz 620s
- El Sobrante, Corona, CA / 3 Deutz 620s
- WWTP, Redlands, CA / 1 Deutz 620, Heat Recovery
- Alta Dena Dairy, Industry, CA / 1 CAT3520, Heat Recovery, Natural Gas, SCR
- Long Beach Aquarium, LB, CA / 2 Deutz 616, Heat Recovery, Natural Gas, SCR



## SAMPLE PROJECTS (continued)

### Microturbines (continued)

- Burbank Landfill, Burbank, CA | 1 250kW Ingersoll-Rand, 10 30 kW Capstone
- Jamacha I, San Diego, CA | 4 60kW Honeywell
- Jamacha II, San Diego, CA | 4 70kW Ingersoll-Rand
- OII, Monterey Park, CA | 6 70kW Ingersoll-Rand
- Calabasas, Agoura Hills, CA | 10 30kW Capstone
- Butterfield, Maricopa, AZ | 1 70kW Ingersoll-Rand
- Allentown WWTP, PA | 13 30kW Capstone
- Toland Road, Ventura, CA | 1 70kW Ingersoll-Rand
- ACME Landfill, Martinez, CA | 4 70kW Ingersoll-Rand
- Mountain View Landfill, CA | 2 70kW Ingersoll-Rand
- American Canyon, Napa, CA | 4 70kW Ingersoll-Rand

### Fuel Cell Technology

- Santa Barbara WWTP, CA | 2 250kW Fuel Cell Energy, Heat Recovery, Fuel Pretreatment
- Palmdale WWTP, CA | 1 250kW Fuel Cell Energy, Heat Recovery, Fuel Pretreatment

### Feasibility Study and Technology Review

- Knott Landfill, Bend, OR | Stirling Biopower pilot project feasibility study
- Short Mountain, Eugene, OR | LFGTE Economic Incentives and Applicability Study
- GVRD, British Columbia, CAN | Wastewater Digester Gas-to-Energy Feasibility Study
- CONEG Study, Northeast US | LFGTE Technology Review and Feasibility

### DIGITAL CONTROL SYSTEMS AND DATA MANAGEMENT SERVICES (SCADA) PROJECTS

- PPL Projects, NJ, PA, and VT | Co-gen facility SCADA, Wonderware system, Remote access, Operator call-out, Trending and Reporting
- American Avenue, Fresno, CA | Leachate Pumping and Flare Control Integration
- Keifer Road, Sacramento, CA | Control Integration Design with 2 LFGTE facilities, 1 flare station, and future LNG facility
- OII, Monterey Park, CA | Control reconfiguration for 2 flares, leachate facility, blower station, LFG conditioning system, and microturbine power plant.
- Crazy Horse, Salinas, CA | Leachate collection monitoring system
- Jamacha, San Diego, CA | Flare station retrofit and LFGTE Microturbine integration
- Calabasas, Los Angeles, CA | Wonderware control for microturbines and LFG pretreatment
- North Island Naval Base, San Diego, CA | Steam injection and vapor extraction facility SCADA
- Bradley Landfill, Sun Valley, CA | SCADA integration for control and monitor of compressor and flare operations
- San Diego County, CA | Countywide SCADA system integrating multiple LFG flares and LFGTE facilities.
- National SCS Data Service | Web based LFG well and probe data system covering over 100 landfills in the USA
- Data Services, Korea | LFG well data management



## SAMPLE PROJECTS (continued)

### SOLID WASTE PROJECTS

- Agua Mansa Material Recovery Facility, CA | *Design/process design for 1500 ton per day material recovery and composting facility*
- Pittsburg Transfer and Recovery Facility | *Design for 1500 ton per day material recovery facility in existing building*
- Cochise County Transfer Stations, AZ | *Design for transfer station utilizing compactors and live floor feed conveyors*
- *Cities of Pasadena and Glendale Material Recovery Feasibility Studies, CA | Sizing, siting, and conceptualization of alternative material recovery facilities and CDM processing facilities*
- Rail Cycle Rail Haul Study, CA | *Large scale facility and watershed database development.*
- Eagle Mountain Landfill, CA | *Preliminary study and layout of Phase 1 and 2 railyard/container handling facilities*
- Santa Maria Landfill, CA | *Final cover system design at the Santa Maria Landfill.*

### LANDFILL GAS COLLECTION AND CONTROL PROJECTS

- Headquarters Landfill, Cowlitz County, WA | *Interim GCCS system design and longterm GCCS system masterplan*
- County of San Diego, CA | *LFG collection and control upgrades for 9 landfills. San Marcos final closure.*
- Knott Landfill, Bend, OR | *Design of 18 wells for migration control, Automated Condensate Re-injection system*
- Los Angeles Superfund Site, Los Angeles, CA | *Design for 350 wells, 8000cfm thermal oxidizer, construction and operations oversight*

## CONFERENCE PRESENTATIONS

- B. Benson, *US Carbon Market*, 14<sup>th</sup> Annual LMOP Conference and Project Expo, Baltimore, Maryland 2011.
- B. Benson, *The Future of the Landfill Gas Market*, Biomass Finance & Investment Summit, Washington D.C. 2010.
- B. Benson, S. King, L. Fortier, G. Friesen, *Review of Three Landfill Gas to Energy Facilities Using Advanced Reciprocating Technology Installed in the Northwest*, SWANA Northwest Regional Symposium, Portland, Oregon 2008.
- B. Benson and S. King, *Expansion of an Existing Landfill Gas to Energy Facility: The Coffin Butte Resource Project*, SWANA 31<sup>st</sup> Annual Landfill Gas Symposium, Houston, Texas 2008.
- Benson, B., and L. LaFountain, *Liquids Collection, Management, and Landfill Gas Impacts at the Oil Landfill*, SWANA 26<sup>th</sup> Annual Landfill Gas Symposium, Tampa, Florida, March 2003.
- Benson, B., and L. LaFountain, *Landfill Gas Migration Monitoring and Landfill Gas System Operation Before, During*, 24<sup>th</sup> Annual SWANA LG Symposium, Dallas, Texas, March 2001.



## CONFERENCE PRESENTATIONS (continued)

- Benson, B., and M. McGuigan, *Comparative Analysis of Landfill Gas Utilization Technologies Including Reciprocating Engines, Gas Turbines, Sterling Cycle, Organic Rankine, and Fuel Cell Technologies*, 18<sup>th</sup> Annual SWANA Landfill Gas Symposium, New Orleans, Louisiana, March 1995.
- Wang, A., B. Benson, and E. Wheless, E., *Microturbine Operating Experience at Landfills*, SWANA 26<sup>th</sup> Annual Landfill Gas Symposium, Tampa, FL, March 2003.
- Benson, B., and J. Pierce, *Case Studies: Three Successful Landfill Gas Fired Microturbine Projects*, SWANA Wastecon, Long Beach, California, October 2002.
- Benson B. *Microturbine Distributed Generation Using Conventional and Waste Fuels*, 7<sup>th</sup> World Congress on Environmental Health, San Diego, California, 2002.
- Benson, B., and J. Pierce, *Jamacha Landfill Microturbine Power Plant Case Study*, 25<sup>th</sup> Annual SWANA Landfill Gas Symposium, Monterey, California, March 2002.
- Benson, B., *Utilization of Technology for Improved Monitoring and Control at LFG Blower and LFG Flare Facilities*, 24<sup>th</sup> Annual SWANA Landfill Gas Symposium, Dallas, Texas, March 2001.

## WORKSHOP PRESENTATIONS

- *Working in the Renewable Energy Industry*, Central Oregon Community College, November 2011.
- *ESI: Bringing Renewable Energy Engineering, Consulting, & Construction to Central OR*, EDCO Pub Talk, March 2011.
- *Caterpillar 3520 Working Group*, SWANA Technical Division Breakout for the 31<sup>st</sup> LFG Symposium, 2008,2009,2010.
- *Landfill Gas Collection and Control*, Korean District Heating and Energy Workshop Training for the Sang Am Landfill, February, 2002.
- *Experience with Capstone and Ingersoll-Rand Microturbines Using Waste Fuels*, DOE/CETC/ CANDRA Workshop on Microturbine Applications, Calgary, Alberta, Canada. January 2003.