

Murphy International Track Record

Murphy International has, for over four decades, established a successful technical and financial track record for sustainable and renewable energy consulting and development. Managing complex project problem solving including fast-track power generating equipment supply, equity finance, site development, and environmental remediation and stewardship. Originally, acting as a manufactures' representative, including tax and leveraged lease financing and asset re-marketing, debt/equity finance, adding operations management for power projects and environmental remediation and recycling ventures, and more recently investment in sustainable energy technology have contributed to **Murphy International's** diversified successful project history. Wind turbine manufacturing and project development, geothermal project repowering and development, solar electric, and fast track project; design, procurement, construction, and operation including many Award-Winning global projects – listed below. Highlighted projects include the world's first wind powered skyscraper – **Bahrain World Trade Center**, the 450 Mw **Biglow Canyon Wind Farm - PGE**, and fast-track 100 Mw **Evander Andrews power complex** for **Idaho Power** two weeks ahead of schedule. Island Nation work for SIDS Dock and IADB Caribbean Basin CHENACT AP RE/EE programs.

Murphy International provided the turnkey supply of the 100 Mw CCGT (W251B12 GT's) simple cycle plant - operational in 17 weeks for Idaho Power including facilitating the EPC guarantee contract with **Innogy** (UK) during the height of the California energy debacle. Similarly, during a phase shifter failure, **Murphy International** provided emergency fast-track project supply of a P&W FT4 gas turbine generator (from **NRG-Summerset**) with DLN emission alpha test equipment installed and operating in synchronous generation, ahead of schedule and below budget, for **Vermont Electric Light Company** (VELCO) in 7 weeks - abating statewide brownouts. **Murphy International** arranged debt and equity financing, negotiated and closed the acquisition of the 12.5 Mw **Stillwater Geothermal power plant** and established the O&M management company providing both ongoing expansion with 30 Mw development and overall complex O&M services.

Equipment Supply – Murphy International Investments/Douglas Murphy Activities				
Project #	Project Description	Client	Country	Professional Staff
1	620 MW VT Yankee Nuclear Plant, Brattleboro Vermont. Complete Primary Coolant and RHR Piping System Supply. Low carbon content (<.02%) SS materials for Marubeni Corporation and Hitachi Ltd.	Yankee Electric	USA	D.Murphy
2	Wisconsin Electric , Kimberly Cogen 240 MW canceled Project resale –(3) Westinghouse 251B12 GT's, GE ST, Nooter Eriksen HRSG,	WEPCO	USA	D. Murphy
3	General Electric Frame 7EA GT Resale for Kinder Morgan	Pinnacle West	USA	D. Murphy, D. Kirkman
4	General Electric 633 MW Combined Cycle Plant resale – GE Frame 7FA's, HRSG, and GE ST for NRG	Avista-STEAG	USA	D. Murphy, D.Kirkman, J. Hittle
5	(2) Westinghouse 251B12 Simple Cycle GT's resale for Utilicorp.	Idaho Power	USA	D. Murphy, D.Kirkman
6	Pratt & Whitney FT4 GT with alpha-DLN Leased from NRG.	VELCO	USA	D. Murphy, D.Kirkman
7	(3) 225 kW Norwin wind turbines mounted on integral bridgeworks spanning twin 54 story building towers	Bahrain World Trade Center	Bahrain, Middle East	D. Murphy, J. Proctor
8	Gas Turbine Cogen Facility Garrett 550 KW GT, HRSG Better Form Installation w/ O&M - Performance Contract	USA Turnkey Metal		D. Murphy, J. Murphy
9	Trisen Governor for Westinghouse ST, Fast-Track steam line valves w/ custom machining -25MW Geothermal	Caithness Steamboat	USA	D. Murphy,
10	930kW Solar T-1200 Mark 1 GT, skid mounted breaker/ enclosure/transformer, switchgear for Bell South	Metcalf-GE	USA	D. Murphy, D. Kirkman

Renewable Energy Developments – Murphy International Investments/Douglas Murphy Activities

Project #	Project Description	Client	Country	Professional Staff
1	1000 MW Wind Generation - Zephyr Power Development LLC, Dumas Texas. Land Investigation and Lease. Wind Evaluation; Anemometer siting, data logging and analysis management, Financial Modeling, Turbine Selection & Layout. JV equity negotiated with Shell Renewables.	Zephyr Power Development LLC	USA	D.Murphy
2	Biglow Canyon – 450 MW Phase 1, Zephyr Power Development Project, Oregon with Orion Energy (formerly Innogy then RWE). Land Investigation and Lease. Wind Evaluation; Anemometer siting, data logging and analysis, Financial Modeling, Turbine Selection & Layout. JV equity partnership negotiated with Innogy.	Zephyr Power Development LLC	USA	D.Murphy
3	Wolverine Creek 65 MW, Idaho Falls, Idaho. Equity partnership w/Airtricity, Inc. Under construction.	Ridgeline Energy	USA	D.Murphy
4	Goshen 2 – Ridgeline and Airtricity are pursuing a 90 MW expansion of the Idaho Falls site. Adjacent to Wolverine Creek wind farm project.	Ridgeline Energy	USA	D.Murphy
5	American Falls –81 MW development of Ridgeline and Airtricity w/proposal to Idaho Power to develop near American Falls, Idaho	Ridgeline Energy	USA	D.Murphy
6	Pah Rah – 100 MW development of Ridgeline. Proposal to Sierra Pacific Resources for project in the Pah Rah mountains, northeast of Reno, Nevada.	Ridgeline Energy	USA	D.Murphy
8	Stillwater 12.5 MW Geothermal Project, Fallon, NV. Raised Equity funding w/Leucadia for Terra Thermal Power. Performed O&M/Development of 30 MW expansion w/Geothermal Management Services (GMS)	Terra Thermal Power/GMS	USA	D.Murphy, D.Abraham, W. Golden
9	Bottle Rock 50 MW Geothermal Project, Calistoga, CA. Due Diligence, Repowering, O&M planning	US Renewables Group	USA	D.Murphy
10	10 MW Recycle to Blue Sky Diesel Biofuels Renewable Energy Project - Midwest Development	Murphy Intl.	USA	D.Murphy
11	Great Lakes Region Coal to Biofuels Recycled Energy District Heating 375,000 Lbs. Steam Plant Conversion	Murphy Intl.	USA	D.Murphy
12	9 MW Waste Heat Recovery Bottoming Cycle w/ESCO	Murphy Intl.	USA	D.Murphy
13	Caribbean Hybrid Wind/Solar/diesel Plant at Resort	Murphy Intl/NA	Dominca	D.Murphy/B.Etienne
14	225 Kw Wind Turbine, CA SGIP funded, Net Metering	Murphy Intl/NA	USA	D.Murphy/B.Etienne
15	1M GPD Biodiesel Plant, 1Mw Fuel Cell, BioGas Design	Murphy Intl/KI	USA	D.Murphy/H.Dickey
16	Wind Powered Sky Scraper, 3 x Wind Turbines (NatGeo)	Murphy Intl/NA	Bahrain	D.Murphy/J.Proctor

Environmental Projects - Murphy International/ Douglas Murphy Activities

#	Project Description	Client	Country	Staff
1	Millstone 1 & 2, Waste Management, Reactor component packaging/transportation	Northeast Utilities	USA	D.Murphy
2	Dresden 1, Fuel Pool Management, packaging/transport	Commonwealth Edison	USA	D.Murphy
3	Tarapur 1, Fuel Pool Management, training/ Fuel Rod Re-racking, Control Rod packaging	US DOE	India	D.Murphy
4	Bettis Atomic Power Laboratory, BAPL Decontamination/Decommissioning HFEF	Westinghouse	USA	D.Murphy
5	PCB transformer, soil, disposal & remediation	Viking Aluminum	USA	D.Murphy
6	Knolls Atomic Power Laboratory, KAPL decontamination/decommissioning SIG prototype	General Electric	USA	D.Murphy
7	Superfund cleanup Project, US Radium, Athens, GA.	State of Georgia DEP	USA	D.Murphy
8	Jaide Paper, Akron, Ohio. Asbestos Cleanup, site remediation. JV with TTECI and McCabe Engineering.	US National Park Service	USA	D.Murphy
9	Decontamination Environmental Release Alodine pits and metal processing facility	Chromium Process Company	USA	D.Murphy
10	Bulk Oil Storage Tank Cleaning/Recycle Product	Various	USA	D.Murphy
11	Bulk Oil Storage Tank -Refinery Decontamination Decommissioning -Northeast	Major Oil Company	USA	D.Murphy
12	PWR Nuclear Reactor Guide Tube Refurbishment Transport/Remote Handling for B&W (Apollo)	VEPCO -Surry & N. Anna	USA	D.Murphy
13	Nuclear License Management for B&W ARIS II Barberton, OH. Receipt-Environmental Release	B&W	USA	D.Murphy
14	Nuclear License Management for B&W ARIS II reactor remote inspection System Evanston, IN	B&W	USA	D.Murphy
15	Waste Management Solidification System Design, Installation-Start-up OPS, NRF -Idaho INEL	US Naval Reactors	USA	D.Murphy
16	Waste Water Treatment Ion Exchange Demineralizer Systems, RV Filter Shield Cask	Westinghouse/Naval Reactors/Pearl Harbor	USA	D.Murphy
17	Portable Nuclear Volume Reduction Incineration System Design-Trailer Mounted	Tennessee Valley Authority	USA	D.Murphy
18	Mobile Solidification system design, Start-up OPS, Transportation & Disposal	Tennessee Valley Authority-Sequoyah	USA	D.Murphy

Consulting Assignments – Murphy International Activities

#	Project Description	Client
1	Bottle Rock 55Mw Geothermal	USRG
2	Rye Patch/Empire Energy	EnXco
3	Manufacturing Site Investigation	Norwin
4	Supply Chain Wind Turbine Manufacturing Start-up	SPS
5	Wind Turbine International Licensing, China, India, Turkey	Norwin
6	Venture Capital, Debt & Equity Raise – Wind Start-up	Norwin America
7	Biomass Acquisition	Liberty
8	Asbestos Cleanup, Remediation. JV w/ TTECI & McCabe	US National Park Service
9	Wind and Solar Feasibility for Resort facility	Hilton
10	Waste Heat Recovery Steel Mfg.	EIJ
11	Mfg. Representation for Japan Geothermal & Biomass supply	TTK
12	Reducing Emissions from Landfills	MSE/EPA
13	Project Plan AK Smart Test Grid –Investment Grant Program	MSE/SWEPSCO/U.AK
14	Community Choice Aggregation RE Plan Marin County	Local Power
15	RI Offshore Wind Development Plan Joint Venture	EPE, Ramboll, Blue Water
16	4 x5Mw Solar PV - Feasibility Retail Malls, Puerto Rico	CCVA
17	50 MW Solar PV Investment Analysis/Structuring	Equity Investor
18	4MW Hydro Electric Station Feasibility & Design, WV	Municipality
19	Community Wind Feasibility, Resource Monitoring, Finance	Private Investor
20	Waste Tire Gasification Energy Center Development, Site and Feedstock supply and Lease, Critical Issues Analysis	Developer
21	Biodiesel Production/Fuel Cell Energy Plant for Cattle Ranch	Ranch
22	Real Estate Community Planning, Sustainable Development	Jamaica
23	Implement RE and EE in Hotel Industry - Caribbean	IDB
24	CCA Wholesale Electric Supply, Renewable Energy	CA County
25	Energy Efficiency project financed by: IDB, GTZ, CDE, UNEP, BL&P and Government of Barbados	NGO's
27	Small Island Developing States Sustainable Energy Projects	UNDP
28	Energy Efficient Buildings (EEB) Hub complex at Navy Yard.	US Dept. Of Energy
29	Sub Saharan Africa Geothermal Technical Advisory	IPP
30	Hawaii Renewable Energy Options Analysis	Investor
31	Wind Turbine Pilot Program West Indies	OAS/DSEC
32	Micro-hydro Energy System, Pagua, Dominica	Investor
33	Wind Energy Project Feasibility Study for Sal, Cape Verde	Utility
34	Development of Distributed Energy Engineering and Management Course Material at Penn State University	PSU
35	Design Criteria for Wind Resource Planning, Baja CA	CA Energy Commission
36	Solar Energy Potential Study	U.S. Dept. of Defense
37	Renewable Energy Policy, Los Angeles County	METRO
38	Clean & Renewable Distributed Generation Technologies	World Resource Institute
39	Sustainable Product Lifecycle Mgt. Curriculum Siemens NX8.5	PSU
40	CHENACT AP Program Developer, Caribbean Basin RE/EE	IDB, UNEP, CDE, GTZ