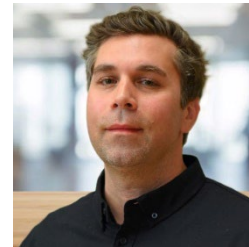


DANIEL M. LEO, SR.

Education

J.D. – University of Baltimore School of Law, 2015
M.S. – Chemical & Biological Engineering; University at Buffalo, 2007
B.S. – Chemical & Biological Engineering; University at Buffalo, 2005
A.S. – Engineering Science, Alfred State College, 2003



Professional Experience

Daniel M. Leo joined SCS in 2022 and has 18 years of experience in renewable energy industries, including fuel ethanol, gasification, pyrolysis, syngas cleaning, fischer-tropsch synthesis, and renewable natural gas (RNG) production. His background is in chemical process engineering and intellectual property management and he currently is a member of the SCS Energy process engineering team, a division within SCS Engineers, which is responsible for the design, construction and operation/maintenance of biogas to Renewable Natural Gas & energy facilities. He provides a wide array of engineering and patent services ranging from innovation to commercialization.

During his career, he invented, commercialized, and authored a portfolio of sixty-three patents & patent applications all over the world directed a renewable energy gasification to liquid fuel technology package.

Landfill Gas to RNG

Waste Management Renewable Energy, LLC – Orchard Hills – Complete engineering design of an 8,000 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ and N₂ PSA separation technology at the Orchard Hills Landfill in Davis Junction, Illinois.

Waste Management Renewable Energy, LLC – Simi Valley – Complete engineering design of a 9,000 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ and N₂ PSA separation technology at the Simi Valley Landfill in Simi Valley, California.

Waste Management Renewable Energy, LLC – Standardized Plants –Sixty percent complete engineering designs of a 3,000 scfm, 4,000 scfm, 6,000 scfm and an 8,000 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ and N₂ PSA separation technology for a site in Houston, Texas.

Waste Management Renewable Energy, LLC - DFW – Complete engineering design of a 5,000 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ and N₂ PSA separation technology at the DFW Landfill in Lewisville, Texas.

Sapphire RNG, LLC – Sapphire (Sampson) - Design, construction & commissioning of a 6,000 scfm landfill gas to pipeline quality renewable natural gas CNG facility utilizing CO₂ membrane and N₂ PSA separation technology at the Sampson County Landfill in Roseboro, North Carolina.

Emerald RNG, LLC – Arbor Hills - Design, construction and commissioning of a 10,000 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ membrane, catalytic O₂ removal and N₂ PSA separation technology at the Arbor Hills Landfill in Northville, Michigan.

Bio Energy (Ohio), LLC – Lorain - Design, construction and commissioning of an 8,000 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ PSA, catalytic O₂ removal and N₂ PSA separation technology at the Lorain Landfill in Oberlin, Ohio.

Bio Energy (Ohio), LLC. - Limestone - Design, construction and commissioning of a 9,000 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ PSA and N₂ PSA separation technology at the Carbon Limestone Landfill in Lowellville, Ohio.

Waste Management Renewable Energy, LLC – Fairless - Complete engineering design of a 6,000 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ and N₂ PSA separation technology at the Fairless Landfill in Morrisville, Pennsylvania.

Prince William RNG, LLC. – Opal Fuels - Design, construction and commissioning of a 6,500 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ membrane and N₂ PSA separation technology at the Prince William Landfill in Manassas, Virginia.

Waste Management Renewable Energy, LLC. - Eco Vista – Thirty percent engineering design of a 3,000 scfm landfill gas to pipeline quality renewable natural gas plant utilizing CO₂ membrane and N₂ PSA separation technology at the Eco-Vista Landfill in Springdale, Arizona.

Other Projects

Fulcrum BioEnergy Inc.'s Sierra BioFuels Plant – Reno, Nevada – Lead process engineer of the feedstock delivery and gasification systems installed at the Fulcrum Bioenergy, Inc. Sierra BioFuels Plant in Reno, Nevada (the world's first garbage to jet-fuel facility). Designed, built, and operated the facility to produce a low-carbon synthetic crude oil using landfill waste as a feedstock. Spend over a decade developing an innovative process for transforming a true waste product into a valuable low-carbon transportation fuel for the aviation industry.

ThermoChem Recovery International (TRI), Inc. Process Demonstration Unit (PDU) – Durham, North Carolina – Lead Process Engineer at TRI's biomass-to-liquids process demonstration unit (PDU) located at TRI's Advanced Development Center (ADC), Durham, North Carolina. Designed, built, and operated the facility which was at the time largest fully integrated biomass to Fischer-Tropsch facility in North America. Operational success at the PDU paved the way for grants, loans, and bonds to build the Fulcrum BioEnergy Inc. Sierra BioFuels Plant.

While at Thermal Kinetics Engineering, PLLC, Leo helped design, build, and commission several fuel ethanol facilities in North America:

Riverland Biofuels - Canton, IL - 37 MMGY

Northeast Biofuels - Fulton, NY - 100 MMGY

Calgren Renewable Fuels - Pixley, CA - 50 MMGY

Panda Ethanol - Hereford, TX - 100 MMGY

Collingwood Ethanol - Collingwood, ON - 13.7 MMGY

Gateway Ethanol - Pratt, KS - 50 MMGY

Heartland Corn Products - Winthrop, MN - 100 MMGY

Global Ethanol - Lakota, IA - 100 MMGY

Miscellaneous

While in law school, Leo was on Law Review and wrote the *Guideline For Patent Eligibility Of DNA and cDNA* which was published in the Journal of the Patent & Trademark Office Society (Volume 96, Issue 2).

This article has in part been adopted by the United States Patent and Trademark Office on how to determine patent eligibility of natural products, e.g., the “markedly different” test in the Manual of Patent Examining Procedure (MPEP) 2106.04(c) The Markedly Different Characteristics Analysis.

Patents & Applications

Canadian Patent No. CA3079720, Liquid fuel production system having parallel product gas generation, Granted on 2020-10-06.

United Kingdom Patent No. GB2580576, Liquid fuel production system having parallel product gas generation, Granted on 2021-01-27.

United Kingdom Patent No. GB2581941, Liquid fuel production method having parallel product gas generation, Granted on 2021-04-28.

United Kingdom Patent No. GB2591650, Liquid fuel production system having parallel product gas generation, Granted on 2022-03-09.

United Kingdom Patent No. GB2599547, Liquid fuel production system having parallel product gas generation, Granted on 2022-08-17.

United States Patent No. US10099200, Liquid fuel production system having parallel product gas generation, Granted on 2018-10-16.

United States Patent No. US10350574, Method for producing a product gas having component gas ratio relationships, Granted on 2019-07-16.

United Kingdom Patent Application No. GB2608021A, Liquid fuel production system having parallel product gas generation, Filed on 2018-10-24.

United Kingdom Patent Application No. GB202207624D0, Liquid fuel production system having parallel product gas generation, Filed on 2022-05-24.

United States Patent No. US10364398, Method of producing product gas from multiple carbonaceous feedstock streams mixed with a reduced-pressure mixing gas, Granted on 2019-07-30.

United States Patent No. US11370982, Method of producing liquid fuel from carbonaceous feedstock through gasification and recycling of downstream products, Granted on 2022-06-28.

United States Patent Application No. US20220325194, Method of producing liquid fuel from carbonaceous feedstock through gasification and recycling of downstream products, Filed on 2022-06-27.

Spanish Patent No. ES2923073, Gaseous product generation system integrated in three-phase energy, Granted on 2022-09-22.

Canadian Patent No. CA3018980C, Three-stage energy-integrated product gas generation system and method, Granted on 2019-04-16.

Chinese Patent No. CN109153929B, Three-stage energy integrated product gas generation system and method, Granted on 2019-12-20.

European Patent Application No. EP4119637A1, Three-stage energy-integrated product gas generation system and method Filed on 2016-03-25

Mexican Patent Application No. MX2018011589A, Three-stage energy-integrated product gas generation system and method, Filed on 2016-03-25.

European Patent No. EP3433340B1, Three-stage energy-integrated product gas generation system, Granted on 2022-06-29.

United States Patent No. US10286431, Three-stage energy-integrated product gas generation method, Granted on 2019-05-14.

United States Patent No. US10287519, Three-stage energy-integrated product gas generation system, Granted on 2019-05-14.

United States Patent No. US10766059, System and method for recovering inert feedstock contaminants from municipal solid waste during gasification, Granted on 2020-09-08.

United States Patent No. US10946423, Particulate classification vessel having gas distributor valve for recovering contaminants from bed material, Granted on 2021-03-16.

Mexican Patent Application No. MX2018009906A, Two-stage energy-integrated product gas generation system and method, Filed on 2016-02-16.

Canadian Patent No. CA3014874C, Two-stage energy-integrated product gas generation system and method, Granted on 2019-03-19.

Chinese Patent No. CN109070156B, Two-stage energy integrated product gas generation system and method, Granted on 2021-08-17.

United States Patent No. US11242988, Two-stage energy-integrated product gas generation system and method, Granted on 2022-02-08.

European Patent No. EP3416757B1, Two-stage energy-integrated product gas generation system and method, 2023-01-11.

United States Patent No. US10222060, Two-stage energy-integrated product gas generation system and method, 2019-03-05.

United States Application No. US20220154930A1, Method for producing a product gas from municipal solid waste with particulate classification, Filed on 2022-01-31.

Australian Patent No. AU2012315914, System and method for syngas clean-up, Granted on 2015-07-09.

Chinese Patent No. CN103958398B, Synthetic gas cleaning system and method, Granted on 2016-01-06.

European Patent Application No. EP2760783A4, System and method for syngas clean-up, Filed on 2012-09-27.

Chinese Patent No. CN105584991B, Synthetic gas cleaning system and method, Granted on 2019-05-14.

United States Patent No. US9499404, System and method for syngas clean-up, Granted on 2016-11-22.

United States Patent No. US9845240, System for syngas clean-up of semi-volatile organic compounds, Granted on 2017-12-19.

United States Patent No. US9783417, System for syngas clean-up, Granted on 2017-10-10.

United States Patent No. US9580315, Method for syngas clean-up of semi-volatile organic compounds, Granted on 2017-02-28.

United States Patent No. US10011482, Method for syngas clean-up of semi-volatile organic compounds with metal removal, Granted on 2018-07-03.

United States Patent No. US10065858, Method for syngas clean-up of semi-volatile organic compounds with solids removal, Granted on 2018-09-04.

United States Patent No. US10011483, Method for syngas clean-up of semi-volatile organic compounds with carbonyl sulfide removal, Granted on 2018-07-03.

United States Patent No. US10214418, Method for converting biomass into fischer-tropsch products with carbon dioxide recycling, Granted on 2019-02-26.

United States Patent No. US10280081, Unconditioned syngas composition and method of cleaning up same for fischer-tropsch processing, Granted on 2019-05-07.

United States Patent No. US11186483, Method of producing sulfur-depleted syngas, Granted on 2021-11-30.

United States Patent No. US10800655, Conditioned syngas composition, method of making same and method of processing same to produce fuels and/or fischer-tropsch products, Granted on 2020-10-13.

United States Patent Application No. US20220098036A1, Method of producing a cooled syngas of improved quality, Filed on 2021-11-23.

United States Patent No. US11466223, Two-stage syngas production with separate char and product gas inputs into the second stage, Granted on 2022-10-11.

United States Patent No. US11555157, System and method for liquid fuel production from carbonaceous materials using recycled conditioned syngas, Granted on 2023-01-17.

United Kingdom Patent No. GB2594571, System and method for liquid fuel production from carbonaceous materials using recycled conditioned syngas, Granted on 2022-12-07.

United States Patent No. US9920926, Pulse combustion heat exchanger system and method, Granted on 2018-03-20.

United States Patent No. US10215401, Pulse combustion heat exchanger system and method, Granted on 2019-02-26.

Canadian Patent No. CA3069675C, Pulse combustion heat exchanger system and method, Granted on 2021-05-11.

European Patent No. EP3622218B1, Pulse combustion heat exchanger system, Granted on 2020-09-09.

United States Patent No. US10329506, Gas-solids separation system having a partitioned solids transfer conduit, Granted on 2019-06-25.

United States Patent No. US11208605, Method for discharging solids from a solids-laden gas, Granted on 2021-12-28.

United States Patent No. US10717102, Pressure-based method and system for measuring the density and height of a fluidized bed, Granted on 2020-07-21.

United States Patent No. US9920712, Method for forming a plurality of plugs of carbonaceous material, Granted on 2018-03-20.

United States Patent No. US10197015, Feedstock delivery system having carbonaceous feedstock splitter and gas mixing, Granted on 2019-02-05.

United States Patent No. US10197014, Feed zone delivery system having carbonaceous feedstock density reduction and gas mixing, Granted on 2019-02-05.

United States Patent No. US11479727, System and method for flexible conversion of feedstock to oil and gas, Granted on 2022-10-25.

Chinese Patent No. CN104169396B, The system and method converted to the elasticity that oil is gentle for raw material, Granted on 2016-08-24.

Chinese Patent No. CN106085469B, System and method for the elastic conversion of feedstock to oil and gas, Granted on 2020-01-17.

European Patent No. EP2773723B1, System and method for flexible conversion of feedstock to oil and gas, Granted on 2018-05-16.

United States Patent No. US10252234, Synchronous single- and double-acting piston feeder system and method, Granted on 2019-04-09.

Chinese Patent No. CN105283307B, Synchronous single and double effect plug feeder system and method, Granted on 2017-03-08.

European Patent Application No. EP2983907A4, Synchronous single- and double-acting piston feeder system and method, Filed on 2013-04-10.

United States Patent No. US9725663, Integrated two-stage thermochemical heat pipe reactor having a partitioned vessel, Granted on 2017-08-08.