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EDUCATION

2012/09 – 2018/07 Ph.D. Institute of Environmental Engineering, National Sun Yat-sen University, Taiwan

2008/09 – 2012/07 B.A. Department of Environmental science and Engineering, National Pingtung University of Science and Technology, Taiwan.

EXPERIENCES

2018/10 – 2019/09	Military Service	Kaohsiung City Government, Taiwan
2017/10 – 2018/09	Visiting Scholar	Department of Environmental Health Sciences, School of Public Health, University of Michigan, Ann Arbor, USA.
2011/11 – 2017/09	Research Assistant	Institute of Environmental Engineering, National Sun Yat-Sen University, Taiwan.

EMPLOYMENT

2019/11 – present	Post Doctoral Research Fellow	RCEC, Academia Sinica, Taiwan

PATENTS

Method for Fabrication Biodiesel (Patent Number: I567185)
Modified Fuel Oil and Method of Fabrication Same (Patent Number: I638884)

HONORS & AWARDS

2018 Outstanding Doctoral Dissertation Award, National Sun Yat-Sen University
2017 Graduate Student Study Abroad Program (GSSAP), Ministry of Science and Technology
2016 Scholarship, Advanced Semiconductor Engineering Group

CERTIFICATIONS

Safety and health supervisor, Taiwan
Dedicated Wastewater and Sewage Treatment Specialist, Taiwan

PROFESSIONAL SERVICE

- Reviewer for Journal of Cleaner Production (SCIE; 2020 Impact Factor = 9.297), Journal of Environmental Management (SCIE; 2020 Impact Factor = 6.789), Energy Reports (SCIE; 2020 Impact Factor = 6.87), Journal of Environmental Chemical Engineering (SCIE; 2020 Impact Factor = 5.909), Energies (SCIE; 2020 Impact Factor = 3.004), Catalysts (SCIE; 2020 Impact Factor = 4.146), Sustainability (SCIE; 2020 Impact Factor = 3.251), Atmosphere (SCIE; 2020 Impact Factor = 2.686), Egyptian Journal of Petroleum.

- Guest editor of Special Issue "Environmental Impact of New Energy Technologies" (Energies SCIE; 2020 Impact Factor = 3.004)

RESEARCH INTEREST

My research interests are mainly focusing on energy and environment. In terms of the amount of fossil fuel available globally, the increasing demand for energy have led to a sharp rise in fuel prices. Environmental problems and energy security are both global concerns. Thus, developing alternatives to the traditional fossil fuels are very important, and both feature routinely in public policy discourses around the world.

There are different kinds of alternative fuels on various applications (e.g., alcohols, dimethyl ether (DME), hydrogen, biodiesels, liquefied natural gas (LNG), etc.). New types of fuel blend strategies on vehicles had been announced in many countries. Since the fuel blends involve different fuel types which may have negative effects on the engine performance, equivalence ratio and energy consumption after the usage. Also, it is necessary to study their GHGs emissions of road transport, vehicle model, driver behavior and traffic-related air pollutants. The identification will help us to pinpoint the contribution of total environmental load, potential environmental impacts, policy implications and further analysis of green transportation.

RESEARCH HIGHLIGHTS

1. Current Research

Reactive nitrogen species including ammonia (NH_3), oxides of nitrogen ($NOx = NO + NO_2$), nitrous acid (HONO) and nitric acid (HNO_3) are known as the major photochemical precursors of $PM_{2.5}$ and/or ozone in the atmosphere. Considering the extremely high density of N-fertilizers applied to agricultural soils in Taiwan, this study hypothesizes that emission of reactive nitrogen species from fertilized soils is substantial and responsible to a certain degree for the unusually high levels of nitrate aerosols and ozone over the agricultural areas. Therefore, this study aims at helping resolve the paradox of air pollution in the agricultural areas of Taiwan. This is the first study upon the impacts of agricultural fertilization to air quality in Taiwan, and the results will provide a strong scientific base for the formulation of an effective strategy for air quality improvement in agricultural areas. Reference: [1] 2019 Sustainability Science Research Program, Academia Sinica.

2. Alternative Fuels and Power for Vehicles

Most of transportation energy utilization was related with petroleum and other liquid fuels. The emissions from vehicle exhausts not only have harmful effects on human health, but also indirectly contribute to climate change. My previous work has investigated the engine combustion, emission characteristics of alternative fuels (including hydrogen, biofuels) over United States / European driving cycle and also discusses their impact on engine performance, energy consumption, GHGs emissions of road transport. One particular area was health risk assessment of aerosol carcinogenicity and mutagenicity emitted by in-use vehicles. The exposures from toxic compounds (PAHs, CBCs) are associated with vehicles emissions during incomplete combustion, which influences respiratory allergy and the risk of lung cancer, especially in high density transportation countries. References: [1] Lin et al., Journal of Hazardous Materials 365 (2019) 771-777; [2] Jhang et al., Applied Thermal Engineering 132 (2018) 586–594; [3] Jhang et al., Fuel 172 (2016) 89–95

3. Well-to-wheel life cycle assessment

Another major area of my study was energy Life Cycle Assessment (LCA). The well-to-wheel LCA assessment is utilized by using Greenhouse gases, Regulated Emissions, and Energy use in Transportation model (GREET). New Bi-fuel vehicles such as bioethanol, biodiesel, natural gas (CNG), Liquefied petroleum gas (LPG), or hydrogen are expected to contribute to energy conservation due to the reduction in the fuel consumption. By combining practical vehicle test results and model simulation to pinpoint the contribution of total environmental load can help to figure out the potential environmental impacts with respect to their specific fuel pathway. References: [1] Jhang et al., Energy 209 (2020).

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

Selected publications

1. **Syu-Ruei Jhang**, Yi-Ying Chen, Yo-Jin Shiau, Chia-Wei Lee, Wei-Nai Chen, Chih-Chung Chang, Chih-Feng Chiang, Horng-Yuh Guo, Pao-Kuan Wang, Charles C.-K. Chou*. **July 2022**. Denitrifiers and Nitrous Oxide Emissions from a Subtropical Vegetable Cropland. **ACS Earth and Space Chemistry.** Accept. DOI:10.1021/acsearthspacechem.2c00106.
2. Yuan-Chung Lin, Sheng-Lun Lin, **Syu-Ruei Jhang***, Kang-Shin Chen*, Chaio-Wen Su, Chien-Er Huang. **Sept 2022**. Energy Saving and Pollutant Emission Reduction by Adding Hydrogen in a Gasoline-fueled Engine. **Aerosol and Air Quality Research**. https://doi.org/10.4209/aaqr.220259.
3. Kassian T. T. Amesho, Pei-Cheng Cheng, Ken-Lin Chang, Yen-Ping Peng, **Syu-Ruei Jhang**, Yuan-Chung Lin. **Nov 2022.** Microwave-assisted deep eutectic solvents/dimethyl sulfoxide system for efficient valorization of sugar bagasse waste into platform chemicals: A biorefinery approach for circular bioeconomy. **Bioresource Technology**. https://doi.org/10.1016/j.biortech.2022.127969
4. Feng-Chih Chou, **Syu-Ruei Jhang**, Sheng-Lun Lin, Chung-Bang Chen, Kang-Shin Chen,Yuan-Chung Lin*. **July 2022**. Emission reduction of NOx,CO, HC, $PM_{2.5}$ and PAHs by using a catalyst in a diesel engine. **Aerosol and Air Quality Research** 22, 220180. DOI:10.4209/aaqr.220180
5. Yuan-Chung Lin, **Syu-Ruei Jhang***, Sheng-Lun Lin*, Kang-Shin Chen. **April 2021** Comparative effect of fuel ethanol content on regulated and unregulated emissions from old model vehicles: An assessment and policy implications. **Atmospheric Pollution Research** 12, 4, 66-75. DOI:10.1016/j.apr.2021.02.014 (SCIE; 2020 Impact Factor = 4.352)
6. **Syu-Ruei Jhang**, Yuan-Chung Lin*, Kang-Shin Chen, Sheng-Lun Lin, Stuart Batterman. **Oct 2020**. Evaluation of fuel consumption, pollutant emissions and well-to-wheel GHGs assessment from a vehicle operation fueled with bioethanol, gasoline and hydrogen. **Energy** 209**,** 118436**.** DOI:10.1016/j.energy.2020.118436 (SCIE; 2020 Impact Factor = 7.147)
7. Yuan-Chung Lin*, Feng-Chih Chou, Ya-Ching Li, **Syu-Ruei Jhang***, Sumarlin Shangdiar. **March 2019**. Effect of air pollutants and toxic emissions from various mileages of motorcycles and aerosol related carcinogenicity and mutagenicity assessment. **Journal of Hazardous Materials** 365, 771-777 (*=equal contribution). DOI: 10.1016/j.jhazmat. 2018.11.056 (SCIE; 2020 Impact Factor = 10.588)
8. Shih Yu-Jen, Chien Shih-Kai, **Syu-Ruei Jhang**, Yuan-Chung Lin*. **April 2019**. Chemical leaching, precipitation and solvent extraction for sequential separation of valuable metals in cathode material of spent lithium ion batteries. **Journal of the Taiwan Institute of Chemical Engineers** 100, 151-159. DOI: 10.1016/j.jtice.2019.04.017(SCIE; 2020 Impact Factor = 5.876)

9. Ken-Lin Chang, Kassian T. T. Amesho, Yuan-Chung Lin*, **Syu-Ruei Jhang**, Feng-Chih Chou, Hua-Chun Chen. **March 2019**. Effects of atmospheric-plasma system on energy efficiency improvement and emissions reduction from a diesel engine. **Journal of Environmental Management** 234, 336-344. DOI:10.1016/j.jenvman. 2019.01.017 (SCIE; 2020 Impact Factor = 6.789)
10. **Syu-Ruei Jhang**, Kang-Shin Chen, Sheng-Lun Lin, Yuan-Chung Lin*, Kassian T. T. Amesho, Chung-Bang Chen. **March 2018**. Evaluation of the reduction in carbonyl emissions and ozone formation potential from the exhaust of a heavy-duty diesel engine by hydrogen-diesel dual fuel combustion. **Applied Thermal Engineering** 132, 586-594. DOI: 10.1016/j.applthermaleng.2017.12.126 (SCIE; 2020 Impact Factor = 5.295)
11. Yuan-Chung Lin, Lee YJ, Shih Yu-Jen*, **Syu-Ruei Jhang**, Chien Shih-Kai. **Mar 2018**. Levels and sources of heavy metals in soil, sediment, and food crop in the vicinity of electric arc furnace (EAF) steelmaking plant: a case study from Taiwan. **Journal of Soils and Sediments** 18, 2562-2572. DOI:10.1007/s11368-018-1963-x (SCIE; 2019 Impact Factor = 3.308)
12. Yen-Ping Peng, Kassian T. T. Amesho, Chin-En Chen, **Syu-Ruei Jhang**, Feng-Chih Chou, Yuan-Chung Lin*. **Feb 2018**. Optimization of Biodiesel Production from Waste Cooking Oil Using Waste Eggshell as a Base Catalyst under a Microwave Heating System. **Catalysts** 8, 81. DOI: 10.3390/catal8020081 (SCIE; 2020 Impact Factor = 4.146)
13. Chia Chi Wang, Ying Chi Lin, Yuan-Chung Lin, **Syu-Ruei Jhang**, Chun-Wei Tung*. **Aug 2017**. Identification of informative features for predicting proinflammatory potentials of engine exhausts. **BioMedical Engineering OnLine** 16, 66. DOI:10.1186/s12938-017-0355-6 (SCIE; 2020 Impact Factor = 2.819)
14. Ken-Lin Chang, Yuan-Chung Lin*, **Syu-Ruei Jhang**, Shang-Cyuan Chen, Way Lee Cheng, Sung-Yuan Mao. **July 2017**. Rapid Jatropha-Castor Biodiesel Production with Microwave Heating and a Heterogeneous Base Catalyst Nano-Ca(OH)2/Fe3O4. **Catalysts** 7, 203. DOI:10.3390/catal7070203 (SCIE; 2020 Impact Factor = 4.146)
15. Po-Ming Yang, Chia Chi Wang, Ying Chi Lin, **Syu-Ruei Jhang**, Li-Jung Lin, Yuan-Chung Lin*. **July 2017**. Development of novel alternative biodiesel fuels for reducing PM emissions and PM-related genotoxicity. **Environmental Research** 156, 512-518. DOI: 10.1016/j.envres.2017.03.045 (SCIE; 2020 Impact Factor = 6.498)
16. **Syu-Ruei Jhang**, Kang-Shin Chen, Sheng-Lun Lin, Yuan-Chung Lin*, Way Lee Cheng. **May 2016.** Reducing pollutant emissions from a heavy-duty diesel engine by using hydrogen additions. **Fuel** 172, 89–95. DOI: 10.1016/j.fuel.2016.01.032 (SCIE; 2020 Impact Factor = 6.609)
17. Po-Ming Yang, Kuang C. Lin, Yuan-Chung Lin*, **Syu-Ruei Jhang**, Shang-Cyuan Chen. **May 2016.** Emission evaluation of a diesel engine generator operating with a proportion of isobutanol as a fuel additive in biodiesel blends. **Applied Thermal Engineering** 100 (5), 268-235. DOI:10.1016/j.applthermaleng.2016.01.118(SCIE; 2020 Impact Factor = 5.295)

18. Po-Ming Yang, Yuan-Chung Lin*, Kuang C. Lin, **Syu-Ruei Jhang**, Shang-Cyuan Chen, Chia Chi Wang, Ying Chi Lin. **Oct 2015**. Comparison of carbonyl compounds emissions from a diesel engine generator fueled with blends of n-butanol, biodiesel and diesel. **Energy** 90, DOI: 266-273. 10.1016/j.energy.2015.06.070 (SCIE; 2020 Impact Factor = 7.147)
19. Yuan-Chung Lin*, Shang-Cyuan Chen, Tzi-Yi Wu, Po-Ming Yang, **Syu-Ruei Jhang**, Jia-Fang Lin. **Apr 2015**. Energy-saving and rapid transesterification of jatropha oil using a microwave heating system with ionic liquid catalyst. **Journal of the Taiwan Institute of Chemical Engineers** 49, 72–78. DOI: 10.1016/j.jtice.2014.11.014 (SCIE; 2020 Impact Factor = 5.876)
20. Yuan-Chung Lin*, Tzi-Yi Wu, **Syu-Ruei Jhang**, Po-Ming Yang, Yi-Hsing Hsiao. **June 2014**. Hydrogen production from banyan leaves using an atmospheric-pressure microwave plasma reactor. **Bioresource Technology** 161, 304–309. DOI: 10.1016/j.biortech.2014.03.067 (SCIE; 2020 Impact Factor = 9.642)
21. Wei-Hsiang Chen, Yuan-Chung Lin*, Jun-Hong Lin, Po-Ming Yang, **Syu-Ruei Jhang**. **Nov 2014**. Treating odorous and nitrogenous compounds from waste composting by acidic chlorination followed by alkaline sulfurization. **Environmental Engineering Science** 31, 583–592. DOI:10.1089/ees.2013.0272 (SCIE; 2019 Impact Factor = 1.907)
22. Yuan-Chung Lin*, Shang-Cyuan Chen, Chin-En Chen, Po-Ming Yang, **Syu-Ruei Jhang**. **Jul 2014**. Rapid Jatropha-biodiesel production assisted by a microwave system and a sodium amide catalyst. **Fuel** 135, 435–442. DOI:10.1016/j.fuel.2014.07.023 (SCIE; 2020 Impact Factor = 6.609)

List of publications (EI journal)

1. Chia-Chi Wang, Ying Chi Lin, Yuan-Chung Lin, **Syu-Ruei Jhang**, Chun-Wei Tung. **Mar 2016**. Prediction of Proinflammatory Potentials of Engine Exhausts by Integrating Chemical and Biological Features. International Conference on Bioinformatics and Biomedical Engineering (IWBBIO) 9656. 293-303.
2. **Syu-Ruei Jhang**, Kang-Shin Chen, Yuan-Chung Lin*, Kuang C. Lin, Po-Ming Yang, Shang-Cyuan Chen. **May 2015**. Experimental investigation of combustion characteristic of a hybrid hydrogen–gasoline engine under the idle driving condition. Architectural, Energy and Information Engineering, 89-93.
3. Po-Ming Yang, Yuan-Chung Lin*, Kuang C. Lin, Tzi-Yi Wu, **Syu-Ruei Jhang**, Shang-Cyuan Chen. **May 2015**. Emission characteristics of waste cooking oil biodiesel/butanol/diesel blends fueled from a diesel engine exhaust. Architectural, Energy and Information Engineering, 65-68.

Others (Invited Talks，Keynote speech et al.)

Invited Talks

- Syu-Ruei Jhang. Well-to-wheels GHGs and air pollutant emissions from mobile sources: A Comparison of Alternative Fuel and Conventional Gasoline Vehicles, Institute of Environmental Engineering, National Sun Yat-Sen University. March 3, 2020.

Attended Conferences

- ICOS Science Conference 2022, 13-15 September 2022 (Oral)
- AGU Fall Meeting 2021. New Orleans, USA. 13-17 December, 2021 (Virtual)
- Food waste and food processing waste for renewable energy production. 2015 Waste to worth conference. Settle, USA. March 30-April 3, 2015.
- Jade Mountain Forum on Sustainable Environment and Environmental Nano-Technology Conference. Tainan, Taiwan. 27-28 April, 2015.
- Association for Environmental Studies and Sciences (AESS) 2014 Conference. New York City, USA. 11-14 June, 2014.
- Regional Specialty Conference. Beijing, China. 18-21 May, 2014.
- 2013 T&T International Aerosol Conference. Bangkok, Thailand. 8-9 November, 2013.