Quantum Oil Refinery: a viable path to meet the Paris Target?

Name: Denis J. Gendron, Physics PhD, Claire Lasers Corporation, Kitchener, ON N2R 1J1

Abstract: *(390 words count)*
Decline by leading nations (China, USA, and Russia) in support of meeting Paris Target is linked to a lack of scalable solutions ready to be implemented for reduction of global GHG emission. Alternative solutions extol benefits yet to be proven scalable, while promote abandoning crude oil altogether. This has already caused significant divestment in large segments of hydrocarbon industry and poses risks for supply integrity of refined products (polymer, jet fuel, lubricant).

Our work found that the best solution resided in the problem. Reinventing oil refining with modern knowledge of quantum electronics and chemical physics, can yield GHG emission reduction to meet Paris Target. We call it quantum oil refinery (QOR) methods. Guided, but not limited, by mechanical and chemical engineering methods, QOR can scale globally in a decade.

The QOR technology is based on a laser-driven electrically powered chemical reactor, coined the name "Laser Crude Cracking (LCC)", capable to breakthrough advances for cracking heavy oil. The LCC reactor was designed to exceed performance of FCC used in traditional oil refining.

I will present the differences between QOR versus traditional refinery, in terms of basic chemical physics and three electrically driven sub-processes key to QOR performance. QOR improves refinery performances: (i) >25% material conversion efficiency, (ii) >75% reduction of CO2 emission, and (iii) >X3 decrease in energy losses in crude material conversion. Deploying QOR in the refinery market can enable global economy to meet the 20/20/20 Paris Target.

QOR do not replace new cleaner energy, but since global economy will depend on mined hydrocarbon for decades, QOR is necessary, since it brings large GHG reduction associated efficiency improvement. Moreover, QOR will herald the transition to electrical transportation because its deployment creates a large increase of market demand for electrical supply.

QOR is a CleanTech technology solution for reducing GHG emission and the depletion problem. As a result of improved material conversion efficiency, QOR can be an instrument of peace, for two reasons: (i) it will reduce the demand on crude oil, and (ii) promote cooperation between leading nations, to build chain of supply to execute the $5T of global QOR construction business.

QOR is a disruptive technology opening a US $5T market that offers high-quality refinery performance; its deployment is practical because it translates into improved refinery ROI. Market forces, not on new taxes, will drive its coming of age.

Biography:

Denis J. Gendron earned a Physics B.Sc. degree from U. de Sherbrooke in 1988. In 1997, he graduated with Physics PhD from University of Waterloo, for his study of photodissociation and photo-ionization processes at molecular-level with pulsed laser in supersonic jet. He build the pulsed laser laboratory of Donna Strickland at UWaterloo (2018 Nobel Prize of Physics). He worked as a laser engineer for national organizations and global corporations: NRC (Ottawa, ON), Fibertek Inc. (Herndon VA) Spectra-Physics Lasers Inc. (SPLI, Mountain View, CA), and Coherent-AMT (now Clarion Medical, Cambridge, ON). In 2003, Denis founded ***Claire Lasers*** to serve manufacturing industries, and ***invitalize inc.*** a start-up dedicated to life sciences.