Shell + NREL: A Global Energy GameChanger

GCxN Cohort 5 Theme: Industrial Electrification

Shell's target is to become a net-zero emissions energy business by 2050, in step with society's progress in achieving the goal of the UN Paris Agreement on climate change. Our current business plans won't get us there, so we are transforming our business and working cross-sector to achieve our targets. As cost-effective, flexible, and efficient industrial electrification technologies are required for new projects and retrofitting existing line-ups, this cohort topic will support Shell's Powering Progress strategy by facilitating effective growth uptake of renewable energy in industry and reducing its Scope 1 emissions.

What are we looking for?

We seek safe, easy to scale, and affordable solutions at the industrial level that contribute to either:

- Reduction of industries' scope one emissions through reduction of fossil fuel combustion by electrification technology
- Chemical process electrification (i.e., heat, shaft power, chemical conversion processes)
- Cost-effective means of upgrading existing or installation of new electrical power system infrastructures such as large-scale heat, grid, and controls to enable flexibility for increased renewables penetration

In scope

Any novel, scalable technology capable of heating, moving, or performing/accelerating/ increasing efficiency of thermal and chemical processes through the application of electricity and electric power. Additionally, any materials or components requiring further performance validation to enable the scale-up of novel technologies for the same purpose.

- Industrial level Power-to-Heat applications that operate next to hydrocarbon-based line-ups or by itself, e.g., industrial heat pumps and thermal storage technologies such as phase change materials.

- Process electrification for separation, molecular transformation, etc., which reduces overall energy demand, improves yield, etc. relevant for the chemical and petrochemical industry.

- Technologies that reduce power losses or cost of electrical power distribution including equipment and system installation as well as, technologies that facilitate high grid penetration of intermittent renewable generation.

- Advanced energy management control systems that enable grid interactivity to deliver optimum plant performance in dynamic electricity market environments.

Out of Scope

Solutions that consist of existing technologies:

- Mechanical vapor recompression, molten salt storage, rock heat storage
- Any available membrane separation on the market
- Electrolyzers
- Traditionally applied electric motors (synchronous, induction)
- Power generation (synchronous or converter-based such as solar PV, WTGs)