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Green Energy Revolution: Distribution Network Infrastructure for hydrogen

Abstract:

Global warming is an accepted fact of life, posing grave consequences in the form of weather patterns with life-threatening outcomes for inhabitants and their cultures, especially those of island countries. These wild and unpredictable weather patterns have persuaded authorities, governments, and industrial leaders to adapt a range of solutions to combat the temperature rise on Earth. One such solution is to abandon fossil fuels (hydrocarbons) for energy generation and employ renewable energy sources, or at least use energy sources that do not generate greenhouse gases. One such energy carrier is hydrogen, which is expected to slowly replace natural gas and will soon be pumped into the energy distribution pipeline network. Since the current energy distribution network was designed for hydrocarbons, its use for hydrogen may pose some threat to the safetyof urban society.

This is the first time a conference presentation has examined the replacement of hydrocarbons by hydrogen from a totally different angle and perspective, by incorporating material science viewpoints. This article discusses hydrogen properties and warns about the issue of hydrogen embrittlement in the current pipeline network if hydrogen is to be pumped through the current energy distribution network, i.e., pipelines. It is recommended that sufficient study and researchbe planned and carried out to ensure the safety of using the current energy distribution network for hydrogen distribution and to set the necessary standards and procedures for future designand construction.