From Methane to Materials: Sustainable Graphene for Next-Gen Batteries

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The International Energy Agency (IEA) reports that anthropogenic methane (CH_4) emissions are responsible for approximately 30% of global warming [1]. Reducing these emissions across all scales in the near term is therefore a critical lever in mitigating climate change. At the same time, increasing geopolitical tensions, rising tariffs and global supply chain disruptions highlight the urgent need for resilient, localised solutions for the production of critical materials.

Here, I will present Levidian's LOOP technology (Figure 1), a system designed to decarbonise carbon-intensive industrial processes, transforming decarbonisation from a cost into a source of revenue [2]. LOOP converts methane into two valuable products, directly at the point of demand: hydrogen and graphene — a super-material with high commercial value that can enhance the intrinsic characteristics of products across a range of industries.

The LOOP process is one of the most sustainable production techniques for graphene. Indeed, when biomethane is used as an input gas and the system is powered by renewable electricity, the resulting graphene can even have a carbon negative footprint.

Levidian graphene's unique characteristics will be presented, along with its application in lithium-ion coin cells, enabling more sustainable batteries with improved performance.

References

[1] Methane and climate change – Global Methane Tracker 2022 – Analysis - IEA
[2] LOOP (levidian.com)

Figures

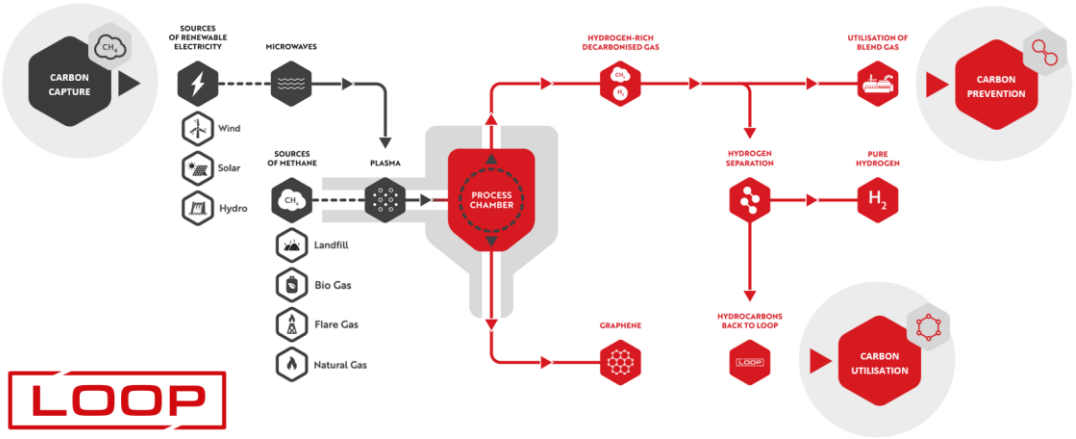

Figure 1: A cold plasma solution that 'cracks' methane gas at low temperature and low pressure, generating hydrogen and high-quality graphene.