

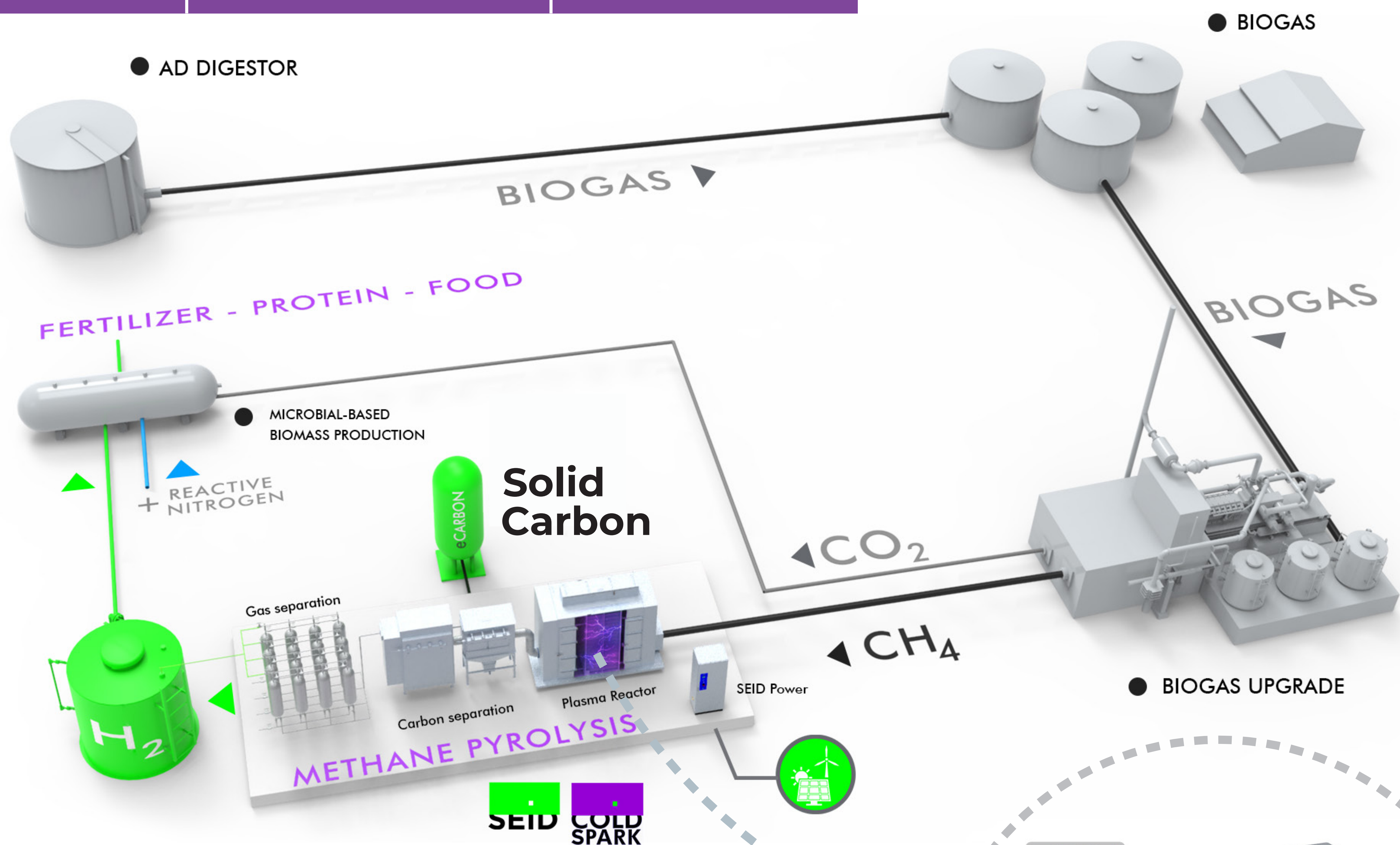
## 1. Biomethane pyrolysis

Biomethane pyrolysis is a promising approach to reduce the carbon footprint during hydrogen production.

	Advantages	Disadvantages
Steam methane reforming (SMR)	Most developed technology	Very high CO <sub>2</sub> emissions, require water
Thermal/ catalytic pyrolysis	A promising new alternative to SMR	High temperatures needed (> 800° C) and high energy demand to reach high temperatures, require catalyst
Non-thermal plasma (ColdSpark®)	Low energy costs, no catalyst, less operational costs, no water	Not yet in TRL9

## 2. Methane cracking using Non-Thermal Plasma

1. **Non-thermal plasma** (NTP) generate the required energy by electron dissociation almost independently of reaction temperature.
2. NTP initiates chemical reactions at remarkably **lower temperatures** than conventional thermochemical reactions.
3. ColdSpark® generates **highly energetic electrons** that have energy to break certain molecules in a very **cost-efficient manner**.
4. **ColdSpark®** can overcome the major disadvantages of high-temperature or catalytic requirements needed by thermal/ catalytic processes.
5. ColdSpark® has **an inherent flexibility** that allows tuning the process parameters in order to optimise energy consumption.



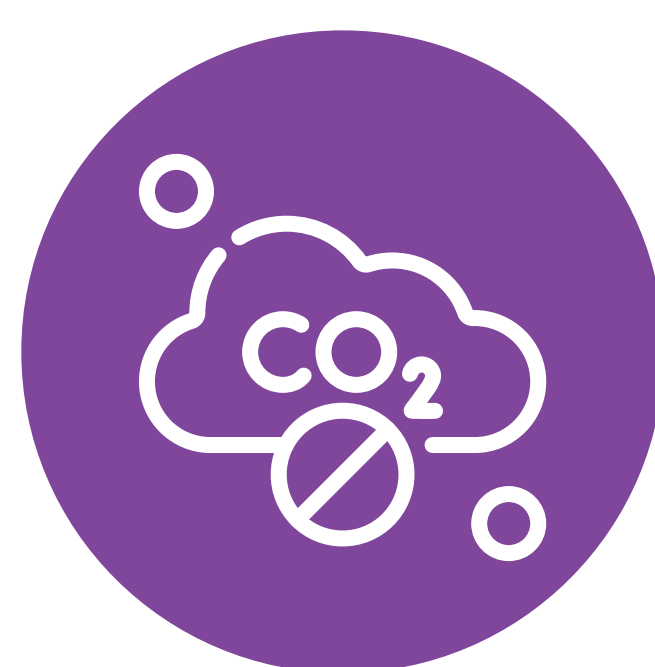
## 3. Project ColdSpark®



H<sub>2</sub>



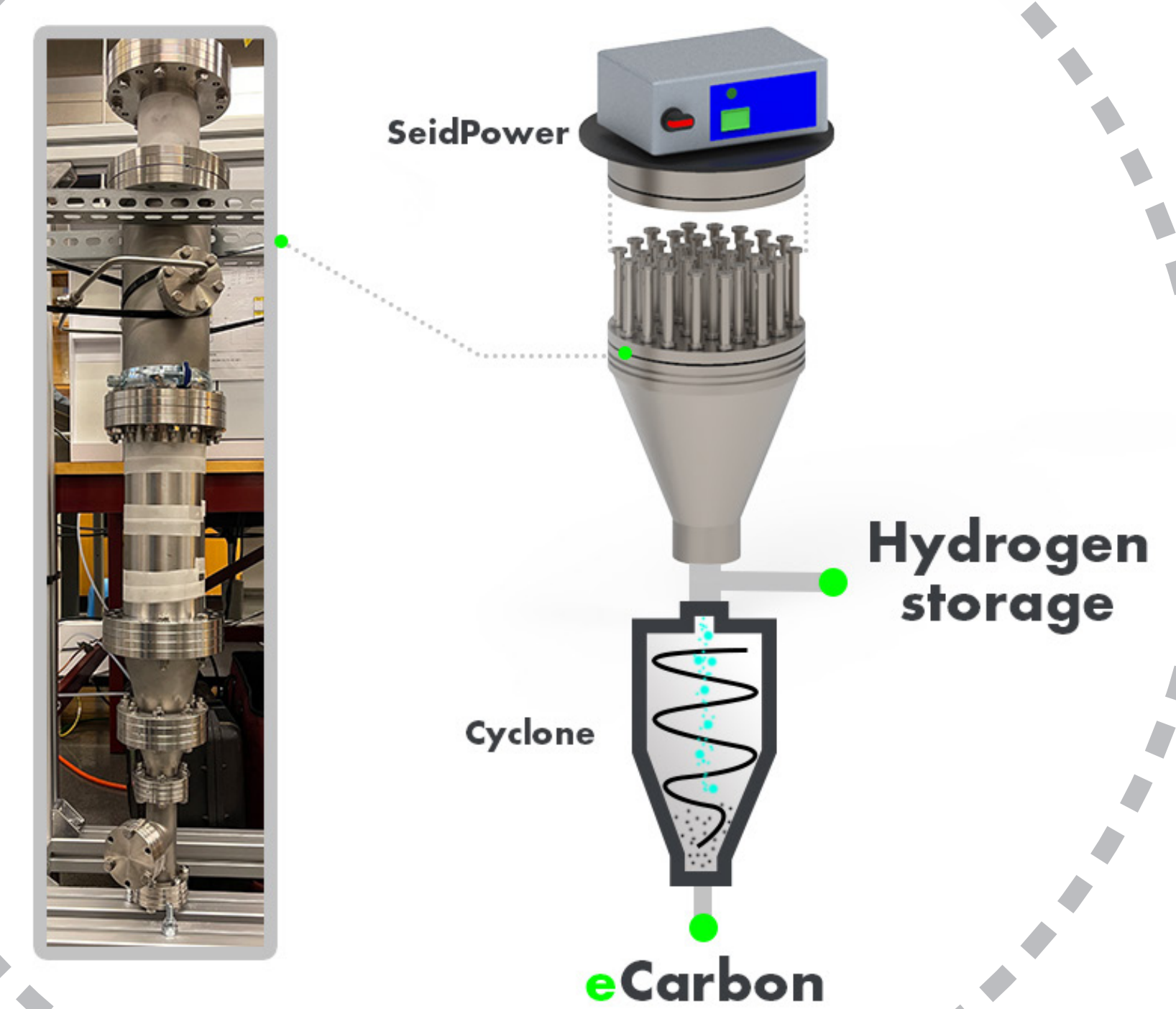
Carbon



Zero CO<sub>2</sub> production



Modular system



Visit project ColdSpark® website: <https://coldspark.eu/>  
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