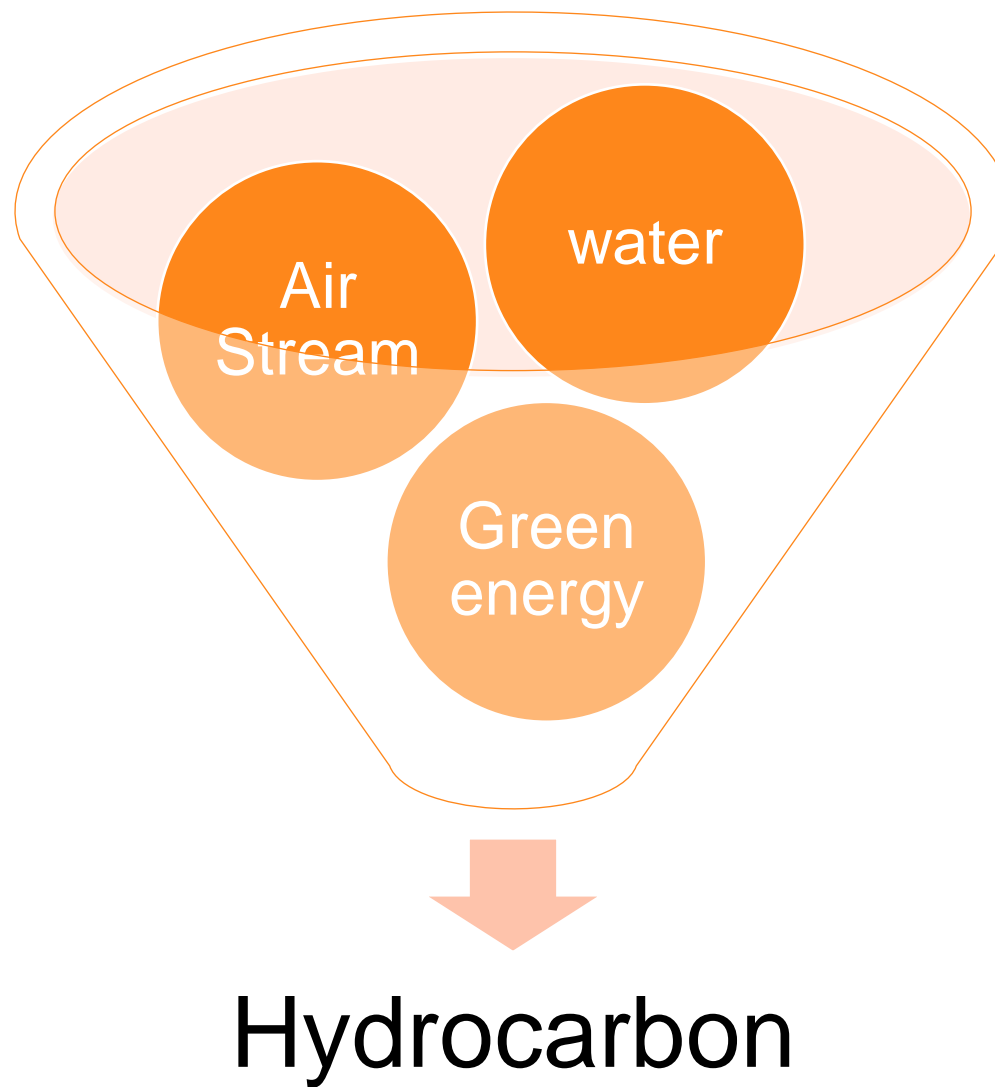


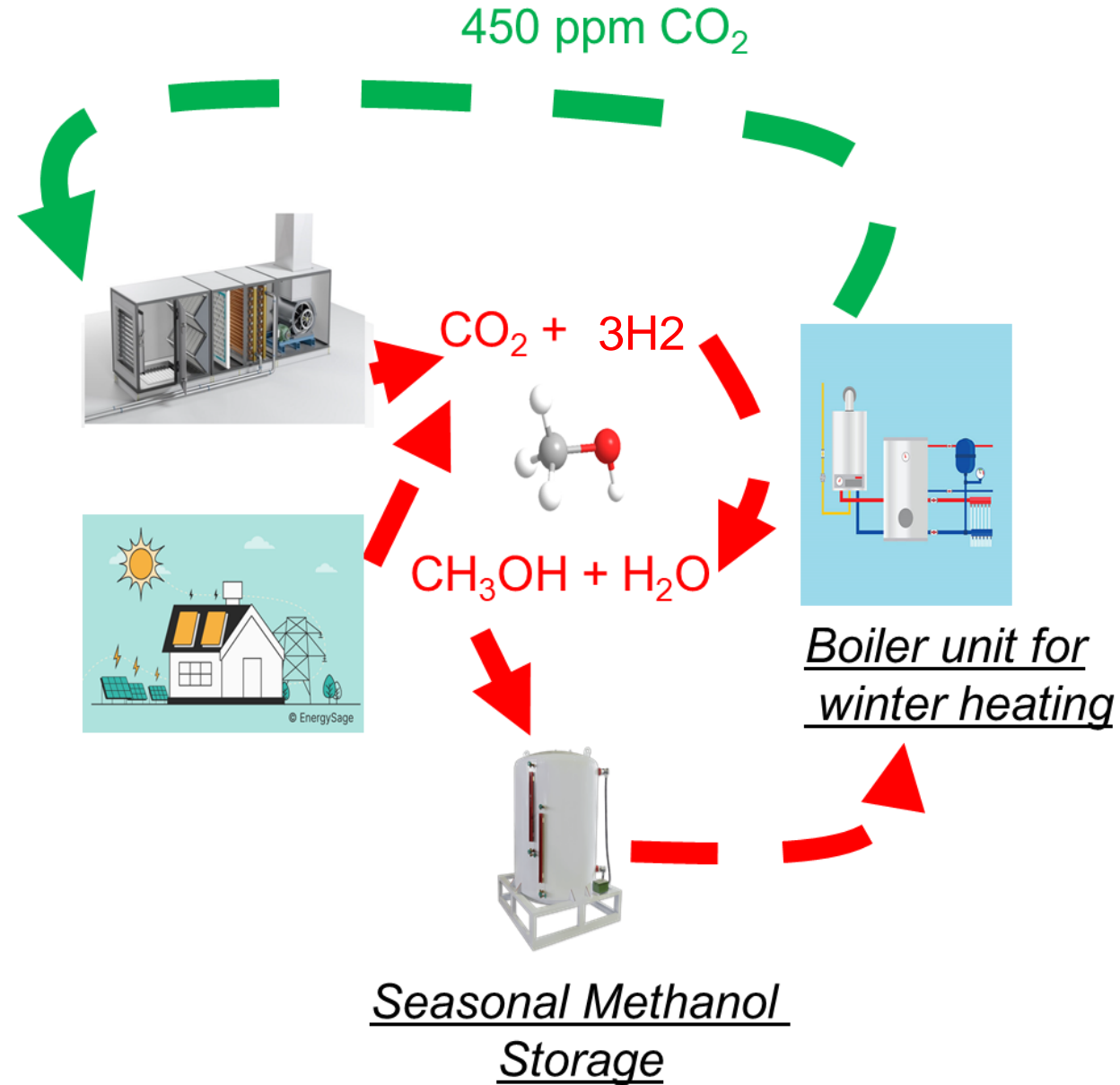
Building Integrated CO₂ Capture

Jacques Gilbert

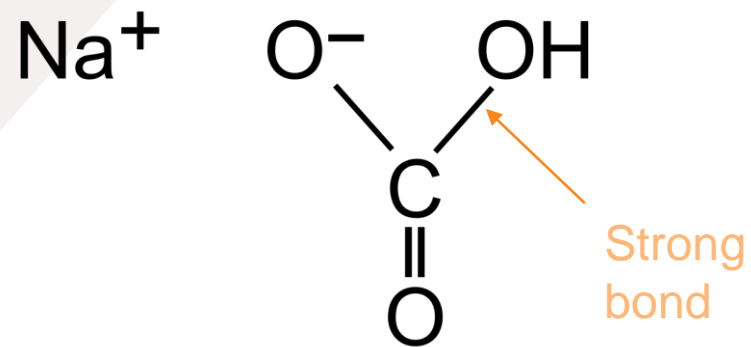
Promoter: Prof. Dr. Ir. Grégoire Léonard

17th of June 2024





Regeneration of HCO_3^- with a catalyst



- Adsorption
 - $\text{Na}_2\text{CO}_3 + \text{CO}_2 + \text{H}_2\text{O} \rightarrow 2\text{NaHCO}_3$
- Regeneration
 - $2\text{NaHCO}_3 \rightarrow \text{Na}_2\text{CO}_3 + \text{CO}_2 + \text{H}_2\text{O}$
- With catalyst [1]
 - $\text{FeOOH} + \text{HCO}_3^- \rightarrow \text{FeOO}^- + \text{H}_2\text{O} + \text{CO}_2$
 - $\text{FeOO}^- + \text{HCO}_3^- \rightarrow \text{FeOOH} + \text{CO}_3^{2-}$

[1] Dutcher, B., Fan, M., Leonard, B., Dyar, M. D., Tang, J., Speicher, E. A., ... & Zhang, Y. (2011). Use of nanoporous FeOOH as a catalytic support for NaHCO₃ decomposition aimed at reduction of energy requirement of Na₂CO₃/NaHCO₃ based CO₂ separation technology. The Journal of Physical Chemistry C, 115(31), 15532-15544.

Thanks for your attention.

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