

## Project X Roads:

A Concept for a Green Energy Park at Rhode was introduced to Offaly CoCo in October 2018.

This concept was derived from the integrated Kalundburg Symbiosis (<http://www.symbiosis.dk/en/#>) concept in Denmark with elements of the Bornholm energy Islands concept ([https://backend.orbit.dtu.dk/ws/portalfiles/portal/235161506/WP\\_P2X\\_Analysisv4.pdf](https://backend.orbit.dtu.dk/ws/portalfiles/portal/235161506/WP_P2X_Analysisv4.pdf)).

As the reaction was positive, it was decided by the development partners, to scope and design the projects for planning.

This took place over 2019 and several pre-planning meetings were held with OCC to help shape and define the concept.

The concept was finalised in early 2020 and OCC asked RPS to prepare an opportunity assessment (attached), planning was submitted in June 2020 and was received in May 2021 for the core concept components.

## **The core components are now Shovel Ready!**

The next graphic shows how the Kalundburg Symbiosis energy and material flows operate, the complexities of operation need to be mapped in order to create a true circular operation of the Energy Park, this is the principle reason for the integration study.



The Rhode Green Energy Park integration study is designed to integrate a suite of energy conversion technologies at the core of the park behind a single meter point that have the ability to route Power to the Gas Grid and to provide critical System Support services and stability to the grid.

The integration of the technologies should create 125+ FTE jobs once the first stage of each is operational

The Rhode Green Energy Park is a priority for County Offaly

<https://www.offaly.ie/eng/Services/Enterprise-Business-Supports/Green-Energy-Technology/>

The Carbon Farming is supported by the Irish Farmers Association who want to diversify their farmers into Carbon markets

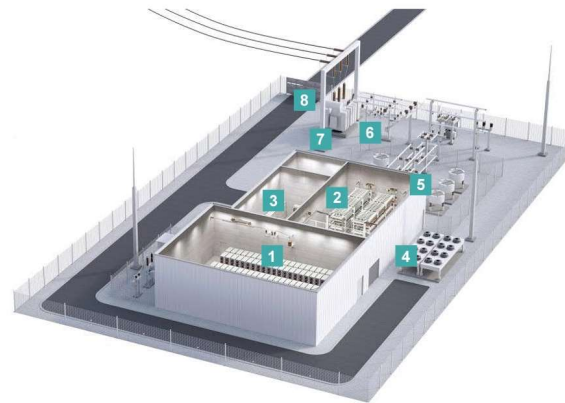
These technologies consist of:

# A Suite of Batteries and a SVC Plus Statcom

## The SVC PLUS Frequency Stabilizer combines Voltage Control and Fast Frequency Support in one unit



Compact footprint through high active power density of super-capacitors and multilevel STATCOM for voltage control



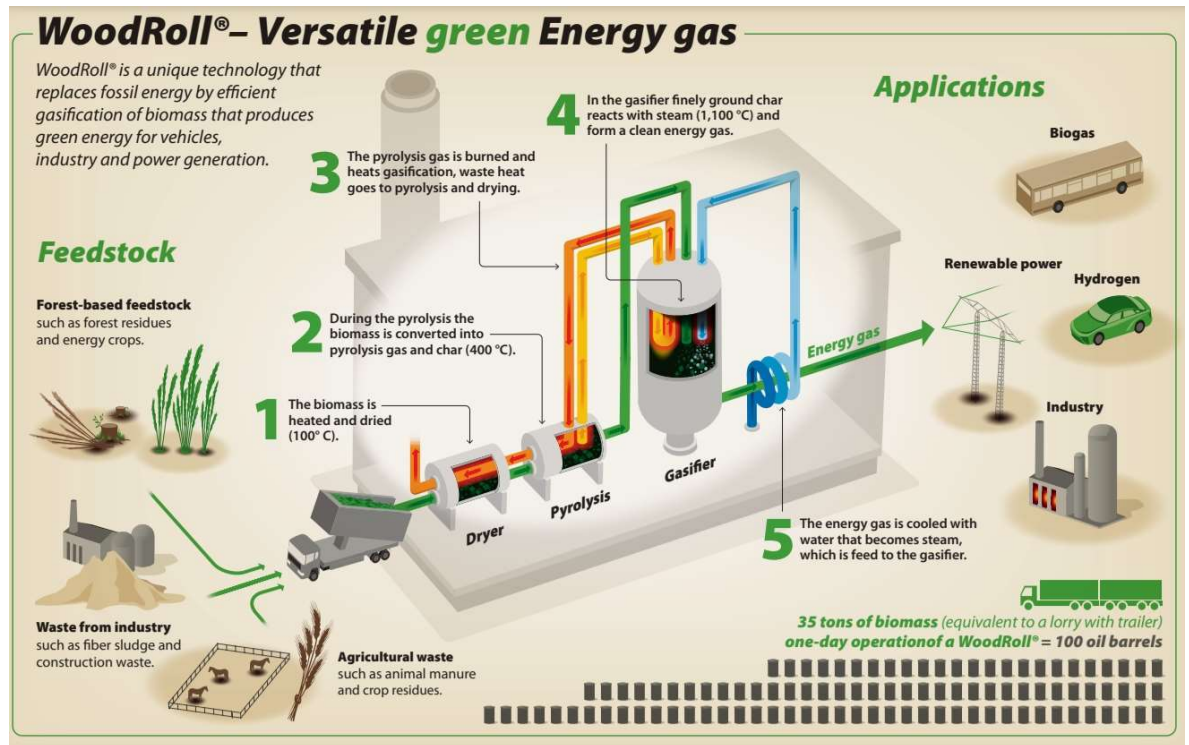
### Technical Data

- Can address any voltage level
- Footprint: 2,565 m<sup>2</sup>
- Active power:  $P_{max} = \pm 50$  MW (full output for 5 seconds)
- Reactive power:  $Q = \pm 60$  Mvar
- Available energy: 450 MJ

Scaling up to 4x units in parallel enables massive power output of  $\pm 200$  MW active power

1	Supercapacitors	5	Phase reactor yard
2	SVC PLUS converter	6	MV switchyard
3	Control room	7	Power HV/MV transformer
4	Cooling	8	Connection to the HV switchyard

# An Ultra Clean Syngas Production Unit



A suite of High Temperature Steam Electrolysis Solid Oxide Electrolysis Cells for Green Hydrogen production

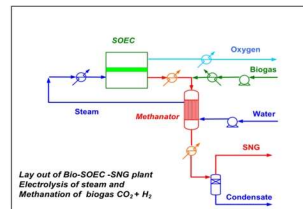
**Solid Oxide Electrolysis Cells (SOEC)**

Versatile technology – High temperature electrolysis

Water electrolysis



- Hydrogen can be used directly or used downstream e.g. for biogas upgrading, NH<sub>3</sub> and MeOH production.



CO<sub>2</sub> electrolysis



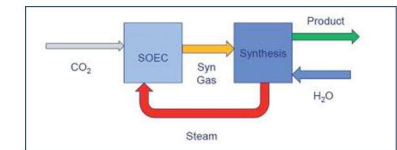
- CO<sub>2</sub> from flue gas stream
- Can be used for CO production



Co-electrolysis

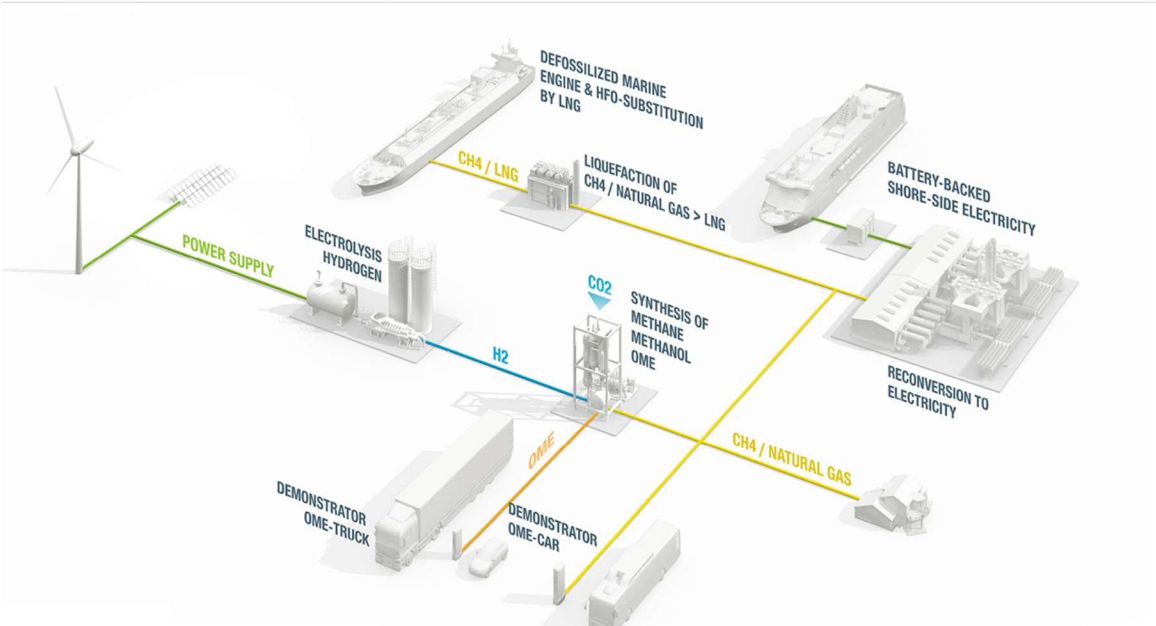


- Syngas (H<sub>2</sub> + CO) can be converted into CO<sub>2</sub>-neutral transportation fuel (CH<sub>4</sub>, diesel, etc.)
- Composition of syngas can be tuned



HALDOR TOPSOE

A Power to X reactor unit



A high efficiency  
semi closed climate  
controlled CO2 fed  
greenhouse (like  
this one in Utah)  
used to grow  
1,000+ tonnes of  
Tomatoes or similar  
per year

