**CS229 project – Optimization of a clean H2 supply chain**

**Model parameters**

These parameters characterize one unit block of each device, which can be assembled into clusters to increase capacity.

1. Battery packs

|  |  |  |
| --- | --- | --- |
| Parameter | Tesla powerpack ([1]) | LG chem ESS for grid([2]) |
|  | 50 kW (AC) | 1.5 MW |
|  | -50 kW (AC) | -1.5 MW |
|  | 0.05 | 0.10 |
|  | 0.95 | 0.95 |
|  | 210 kWh | 6.0 MWh |
|  | ?? $/(kW/hr) | |
|  | 89% | 85% |

1. Pressure vessel

|  |  |
| --- | --- |
| Parameter | Average H2 stationary vessel (345bar) ([3], [4], [5]) |
|  | No constraint: 200-300 kg(H2)/hr |
|  | 92 kg(H2)/hr (limited by H2 compressor) |
|  | 0.1 |
|  | 1.0 |
|  | 1500 kg(H2) |
|  | 50 kW/kg(H2) |

1. Electrolyzer

|  |  |  |
| --- | --- | --- |
| Parameter | NEL alkaline A-range ([6]) | Mc Lyzer 200-30([7]) |
|  | 0.64 MW (150Nm3/hr) | 1.0 MW (200Nm3/hr) |
|  | 15% of max | 20% of max |
| nom | 3.8/4.4 kWh/Nm3 | 4.5 kWh/Nm3 |
|  | ?? $/((kg(H2)/hr)/hr) | |
|  | 1.0/200 bar | 30 bar |

References:

[1] <https://www.tesla.com/fr_FR/powerpack?redirect=no>

[2] <http://www.lgchem.com/upload/file/product/LGChem_Catalog_Global_2018.pdf>

[3] <https://www.hydrogen.energy.gov/pdfs/review11/pd088_zhang_2011_o.pdf>

[4] <https://www.hydrogen.energy.gov/pdfs/review15/st100_james_2015_o.pdf>

[5] <https://www.nrel.gov/docs/fy14osti/58564.pdf>

[6] <https://nelhydrogen.com/assets/uploads/2017/01/Nel_Electrolyser_brochure.pdf>

[7] <https://mcphy.com/en/our-products-and-solutions/electrolyzers/large-capacity/>