**Appendix A: CAPEX and OPEX correlations**

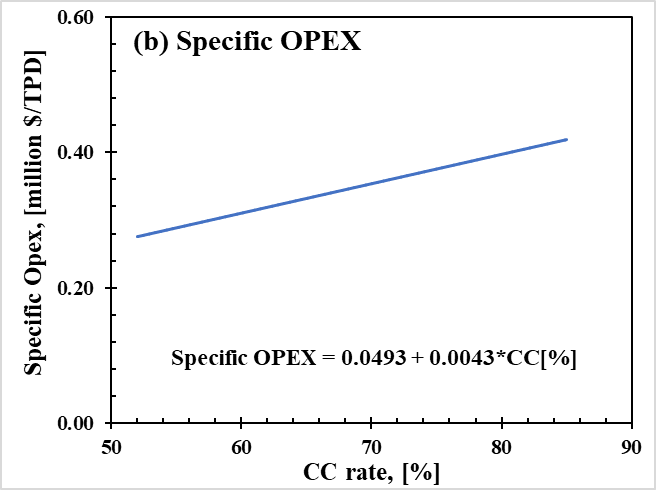
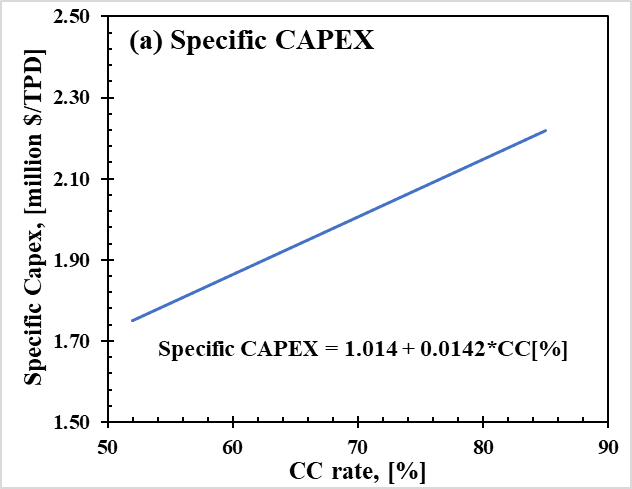
To develop correlations between the capacity, CC rate, and the CAPEX and OPEX of the SMR the available cost data in [1][2][3] are represented as specific CAPEX and specific OPEX as shown in Table A.1. Then, the specific CAPEX and specific OPEX are plotted versus the CC rate as shown in Fig. A1(a, and b). After that, the trend line equations can be used to calculate the CAPEX and OPEX at other plant capacities and CC rates as shown in (Eqn. A1) and OPEX (Eqn. A2).

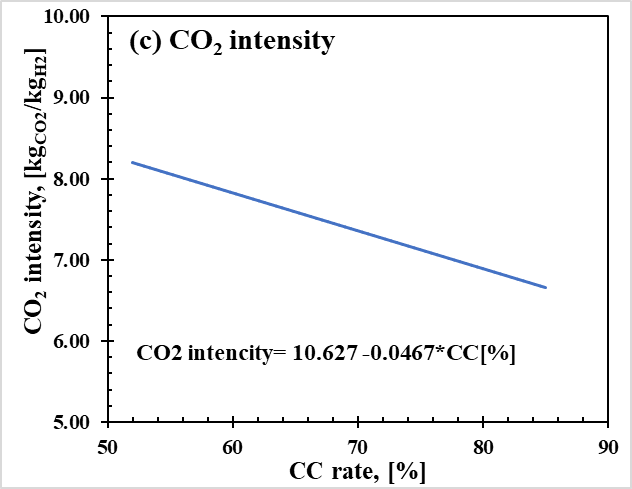
(A1)

(A2)

Table A.1 Data of CAPEX, OPEX, and CO2 intensity of SMR hydrogen production system at different carbon capture rate.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Plant Capacity** | **CC rate** | **CAPEX** | **OPEX** | **Specific CAPEX** | **Specific OPEX** | **CO2 intensity** |
| [TPD] | [%] | [million US$] | [million US$] | [million US$/TPD] | [million US$/TPD] | [kgCO2/kgH2] |
| 607 | 52 | 1063 | 167 | 1.75 | 0.28 | 8.20 |
| 607 | 85 | 1347 | 254 | 2.22 | 0.42 | 6.66 |





**Fig. A1.** Relationship between carbon capture rate (CC) and (a) specific CAPEX, (b) specific OPEX, and CO2 intensity of SMR hydrogen production system.

Similarly, the CO2 intensity is plotted versus the CC rates (at 52% and 85%) as shown in Fig. A1(c). Then, the trend line equation can be used to calculate the intensity at other CC rates as shown in Eqn. A3.

(A3)

**References**

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[2] A. Okunlola, T. Giwa, G. Di Lullo, M. Davis, E. Gemechu, and A. Kumar, “Techno-economic assessment of low-carbon hydrogen export from Western Canada to Eastern Canada, the USA, the Asia-Pacific, and Europe,” *Int. J. Hydrogen Energy*, vol. 47, no. 10, pp. 6453–6477, 2022, doi: https://doi.org/10.1016/j.ijhydene.2021.12.025.

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