**Supplementary tables**

**Table 1.** Equations decsribing the economic parameters.

|  |  |
| --- | --- |
| **Equations** |  |
|  | (7) |
|  | (8) |
|  | (9) |
|  | (10) |
|  | (11) |
|  | (12) |
|  | (13) |
|  | (14) |
|  | (15) |
|  | (16) |
|  | (17) |
|  | (18) |
|  | (19) |

**Techno-economic results**

|  |  |  |  |
| --- | --- | --- | --- |
| **Scenario** | **Product Distribution** | **Net Energy Requirements** | **Economic Parameters** |
|  |  |  | * CAPEX (M$): 79.06 * OPEX (M$/y): 26.57 * Annual Sales (M$/y): 49.54 * Annual Profit (M$/y): 22.97 * ROI: 29.05% * Payback period (years): 3.4 |
|  |  |  | * CAPEX (M$): 69.95 * OPEX (M$/y): 26.07 * Annual Sales (M$/y): 41.37 * Annual Profit (M$/y): 15.30 * ROI: 21.87% * Payback period (years): 4.6 |
|  |  |  | * CAPEX (M$): 56.90 * OPEX (M$/y): 25.40 * Annual Sales (M$/y): 30.48 * Annual Profit (M$/y): 5.09 * ROI: 8.94% * Payback period (years): 11.2 |
|  |  |  | * CAPEX (M$): 93.90 * OPEX (M$/y): 26.88 * Annual Sales (M$/y): 51.31 * Annual Profit (M$/y): 24.43 * ROI: 26.02% * Payback period (years): 3.8 |
|  |  |  | * CAPEX (M$):83.03 * OPEX (M$/y): 26.35 * Annual Sales (M$/y): 42.86 * Annual Profit (M$/y): 16.51 * ROI: 19.88% * Payback period (years): 5.0 |
|  |  |  | * CAPEX (M$): 67.47 * OPEX (M$/y): 25.62 * Annual Sales (M$/y): 31.58 * Annual Profit (M$/y): 5.96 * ROI: 8.84% * Payback period (years): 11.3 |
|  |  |  | * CAPEX (M$): 74.35 * OPEX (M$/y): 26.47 * Annual Sales (M$/y): 46.80 * Annual Profit (M$/y): 20.33 * ROI: 27.34% * Payback period (years): 3.7 |
|  |  |  | * CAPEX (M$): 65.80 * OPEX (M$/y): 25.99 * Annual Sales (M$/y): 39.08 * Annual Profit (M$/y): 13.09 * ROI: 19.90% * Payback period (years): 5.0 |
|  |  |  | * CAPEX (M$): 90.98 * OPEX (M$/y): 26.82 * Annual Sales (M$/y): 49.51 * Annual Profit (M$/y): 22.69 * ROI: 24.94% * Payback period (years): 4.0 |
|  |  |  | * CAPEX (M$): 80.46 * OPEX (M$/y): 26.29 * Annual Sales (M$/y): 41.35 * Annual Profit (M$/y): 15.06 * ROI: 18.71% * Payback period (years): 5.3 |
|  |  |  | * CAPEX (M$): 68.64 * OPEX (M$/y): 26.35 * Annual Sales (M$/y): 43.56 * Annual Profit (M$/y): 17.20 * ROI: 25.06% * Payback period (years): 4.0 |
|  |  |  | * CAPEX (M$): 60.76 * OPEX (M$/y): 25.89 * Annual Sales (M$/y): 36.38 * Annual Profit (M$/y): 10.49 * ROI: 17.27% * Payback period (years): 5.8 |
|  |  |  | * CAPEX (M$): 87.53 * OPEX (M$/y): 26.75 * Annual Sales (M$/y): 47.39 * Annual Profit (M$/y): 20.64 * ROI: 23.58% * Payback period (years): 4.2 |
|  |  |  | * CAPEX (M$): 77.42 * OPEX (M$/y): 26.23 * Annual Sales (M$/y): 39.58 * Annual Profit (M$/y): 13.35 * ROI: 17.24% * Payback period (years): 5.8 |