**CHP Technology Sizing, Cost, and Performance from Other References.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Technology** | **Boiler steam turbine** | **Gas turbine** | **Combined cycle** | **Fuel cell** | **Internal combustion engine** | |
| **CHP reference** | NREL [[1](#_ENREF_1), [2](#_ENREF_2)] | EPA and NREL [[3-5](#_ENREF_3)] | EPA and Steam turbine book [[6](#_ENREF_6), [7](#_ENREF_7)] | NREL and DOE [[4](#_ENREF_4), [8-10](#_ENREF_8)] | Columbus Water Works [[11](#_ENREF_11)] | |
| **Performance** | Circulating fluidized bed  combustor (CFBC) and turbogenerator | Industrial or Frame | Gas Turbine With Boiler | Molten Carbonate | Lean-burn | Advanced generation |
| **Size (KW)** | 42,000 | 1,000-250,000 | 500-300,000 | 200 kW per unit | 110-2,700 | 400-3,370 |
| **Electrical efficiency (%)** | 30% or lower | 27-45% | 37-40% | 40-50% | 30-38% | 37-42% |
| **Thermal efficiency (%)** | Depends | - | - | - | 41-49% | 35-43% |
| **CHP efficiency (%)** | ~70% | 65-72% | 70-80% | 65-95% | 70-80% | |
| **Installed capital ($/KW)** | Boiler:$677;Turbogenerator: $225;Total CHP: $1623/KW | $445-$929 | $1,248-$3,281 | $2,160-$5,500 | $465-$1,600 | $465-$1,200 |

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