

Renewable Energy Technologies

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# 1 Introduction

{{ company\_name }} Project: {{ project\_name }} Client: {{ client\_name }} Location: {{ site\_location }} Date: {{ report\_date }}

System Capacity: {{ system\_capacity }} Number of Panels: {{ panel\_count }} Annual Generation: {{ annual\_generation }} Annual Savings: {{ annual\_savings }} Payback Period: {{ payback\_period }}

Generated by: {{ generated\_by }} Report Date: {{ generation\_date }}

# Facilities

These are the facilities that comprise the SWIS.

|  |  |
| --- | --- |
| **Facility Name** | **Facility Code** |
| {%-tr for facility in facilities %} | |
| {{ facility.facility\_name }} | {{ facility.facility\_code }} |
| {%-tr endfor %} | |

# Technologies

\*\*Generation and Storage Technologies for ({{demand\_year}})\*\*

These are the technologies that are relevant to modelling the decarbonisation of the SWIS. The data has been sourced from the CSIRO GENCOST report. From the Capex down the attributes vary by year. The reference year is {{demand\_year}}.

{%- for technology in technologies %}

## {{technology.name}}

{{technology.description}}

### Technology Attributes:

• Renewable: {{technology.renewable}}

• Dispatchable: {{technology.dispatchable}}

• Lifetime: {{technology.lifetime}} years

• Discount Rate: {{technology.discount\_rate}}%

• Emissions: {{technology.emissions}} kg/MWh

• Area: {{technology.area}} km²/MW

{%- if technology.capex %}

• Capex: ${{technology.capex}}/kW

{%- endif %}

{%- if technology.fom %}

• Fixed O&M: ${{technology.fom}}/kW/year

{%- endif %}

{%- if technology.vom %}

• Variable O&M: ${{technology.vom}}/MWh

{%- endif %}

{%- if technology.fuel %}

• Fuel Cost: ${{technology.fuel}}/GJ

{%- endif %}

{%- if technology.is\_generator %}

### Generator Attributes

• Capacity Max: {{technology.capacity\_max}} MW

• Capacity Min: {{technology.capacity\_min}} MW

• Rampdown Max: {{technology.rampdown\_max}}%/min

• Rampup Max: {{technology.rampup\_max}}%/min

{%- endif %}

{%- if technology.is\_storage %}

### Storage Attributes

• Discharge Loss: {{technology.discharge\_loss}}%

• Discharge Max: {{technology.discharge\_max}}%

• Parasitic Loss: {{technology.parasitic\_loss}}%

• Recharge Loss: {{technology.recharge\_loss}}%

• Recharge Max: {{technology.recharge\_max}}%

{%- endif %}

{%- endfor %}

# Technologies Summary Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Technology** | **Type** | **Renewable** | **Dispatchable** | **Lifetime** | **Emissions** |
| {%-tr for technology in technologies %} | | | | | |
| {{technology.name}} | {%- if technology.is\_generator %} Generator{%- elif technology.is\_storage %} Storage{%- else %} Other{%- endif %} | {{technology.renewable}} | {{technology.dispatchable}} | {{technology.lifetime}} | {{technology.emissions}} |
| {%-tr endfor %} | | | | | |

## With More Detailed Attributes Table:

{%- for technology in technologies %}

# {{technology.name}} - Detailed Attributes

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Value** | **Description** |
| {%-tr for attr in [  ('Renewable', technology.renewable, 'Whether the technology can be renewed'),  ('Dispatchable', technology.dispatchable, 'The technology can be dispatched at any time when required'),  ('Lifetime', technology.lifetime ~ ' years', 'The operational lifetime of the technology'),  ('Emissions', technology.emissions ~ ' kg/MWh', 'CO2 emissions in kg/MWh'),  ('Area', technology.area ~ ' km²/MW', 'The area occupied by a technology')  ] %} | | |
| {{ Attr[0] }} | {{ Attr[1] }} | {{ Attr[2] }} |
| {%-tr endfor %} | | |
| {%- if technology.capex or technology.fom or technology.vom %}  {%-tr for attr in [  ('Capex', '$' ~ technology.capex ~ '/kW', 'The initial capital expenditure for the technology') if technology.capex,  ('Fixed O&M', '$' ~ technology.fom ~ '/kW/year', 'The fixed operating cost of the technology') if technology.fom,  ('Variable O&M', '$' ~ technology.vom ~ '/MWh', 'The variable operating cost of the technology') if technology.vom  ] if attr %} | | |
| {{ attr[0] }} | {{ attr[1] }} | {{ attr[2] }} |
| {%- endif %}  {%-tr endfor %} | | |

\*\*{{technology.name}} - Detailed Attributes\*\*

{%- if technology.is\_generator %}

## Generator Specific Attributes

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Value** | **Description** |
| {%-tr for attr in [  ('Capacity Max', technology.capacity\_max ~ ' MW', 'The maximum capacity of the technology'),  ('Capacity Min', technology.capacity\_min ~ ' MW', 'The minimum capacity of the technology'),  ('Rampdown Max', technology.rampdown\_max ~ '%/min', 'The maximum rampdown rate of the technology'),  ('Rampup Max', technology.rampup\_max ~ '%/min', 'The maximum rampup rate of the technology')  ] %} | | |
| {{ attr[0] }} | {{ attr[1] }} | {{ attr[2] }} |
| {%-tr endfor %} |  |  |

{%- endif %}

{%- if technology.is\_storage %}

## Storage Specific Attributes

|  |  |  |
| --- | --- | --- |
| **Attribute** | **Value** | **Description** |
| {%-tr for attr in [  ('Discharge Loss', technology.discharge\_loss ~ '%', 'The percentage capacity that is lost in discharging'),  ('Discharge Max', technology.discharge\_max ~ '%', 'The maximum percentage of storage capacity that can be discharged'),  ('Parasitic Loss', technology.parasitic\_loss ~ '%', 'The percentage of storage capacity lost other than by charging or discharging'),  ('Recharge Loss', technology.recharge\_loss ~ '%', 'The percentage capacity that is lost in recharging'),  ('Recharge Max', technology.recharge\_max ~ '%', 'The maximum recharge rate of the technology')  ] %} | | |
| {{ attr[0] }} | {{ attr[1] }} | {{ attr[2] }} |
| {%-tr endfor %} |  |  |

{%- endif %}