SOLAR COGENERATION


Johnson Controls
If you are in the dark on how your facility can be both sustainable & comfortable at an affordable cost, we can help you see the light. Air conditioning is a significant source of peak power demand, stressing the power grid just when solar resources are most abundant. Our integrated solar cooling system offers building owners and managers a unique and reliable way to keep their facilities comfortable all while reducing energy costs and improving their environmental sustainability.

The most efficient use of solar energy

The innovative solution combines proven silicon PV technology with concentrating optics, and an advanced thermal system to cogenerate heat and electricity in one integrated hybrid receiver, in order to deliver heat, cooling, and electricity. This cogeneration solution helps enhance savings and also cools the PV components, increasing their efficiency and boosting the system’s longevity and electricity generation.
Solar Cogeneration

Solar cogeneration utilizes 15% of the sun's energy to produce electricity AND also captures up to 60% of the waste heat, resulting in a 75% overall system efficiency. Taking it a step further, our cogeneration system is able to take the hot water produced and use it to drive an absorption chiller to produce chilled water for a variety of air conditioning and process cooling applications. And when the sun isn’t shining, existing boilers and chillers continue to operate, optimizing reliability and sustainability.

Bright benefits

- Solar cogeneration technology allows customers to harness the power of the sun to generate renewable heating, electricity and cooling, significantly reducing a portion of their natural gas and electricity consumption to sustainably supply energy for daily operations.
- Solar cogeneration reduces greenhouse gas emissions 2.6X compared with PV alone and 1.3X compared with standard hot water alone.

The perfect choice

Solar cogeneration systems are ideal for applications that have space available for solar collectors, such as:

- Government
- Technology
- Healthcare
- Food & Beverage
- Campus (University / Corporate)
- Industrial
- Commercial

<table>
<thead>
<tr>
<th>Cooling &amp; Electricity Delivered</th>
<th>100 tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Cooled¹</td>
<td>ft²</td>
</tr>
<tr>
<td>Electrical Output²</td>
<td>Electrical Nameplate Power (kW) (+/-5%)</td>
</tr>
<tr>
<td></td>
<td>Annual Electricity Generation (kWh AC)³</td>
</tr>
<tr>
<td>Heat Output³</td>
<td>Heat Nameplate Power (kW)</td>
</tr>
<tr>
<td></td>
<td>Annual Heat Generation (therms)</td>
</tr>
<tr>
<td>Space Required⁴</td>
<td>ft²</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions Reduction⁴</td>
<td>KgCO₂</td>
</tr>
</tbody>
</table>

Product specifications are only valid when using the product in accordance with our design and installation guidelines using our supplied components. Product specifications are subject to change without notice.

¹ Based on average ASHRAE cooling load at 280 ft²/ton
² Nameplate based on 1-D tracking PV Watt equivalent in Phoenix, AZ. Annual generation at T_in = 200 °F, T_out = 210 °F
³ Includes row spacing
⁴ Based on an annual average electric grid emissions factor (960 grams of CO₂/kWh of electricity)
An experienced solar team

As a global leader in energy efficiency and sustainability, Johnson Controls can help you harness a portion of the sun’s energy to meet your heating, cooling and energy needs using this most renewable of resources. We can take responsibility for everything, from design, engineering and financing, to operations and maintenance of the system. And, we’ll help you improve the financial return from your solar installation by leveraging whatever federal, state and local grants, rebates and incentives are available in your area.

Everything under the sun

Solar project development requires interfacing and partnering with a number of key stakeholders, including utilities for grid connection and rebates, investors for financing packages, manufacturers for equipment, among others. Johnson Controls manages these relationships to save you time and money so you work with one trusted partner. We have developed strategic partnerships with several investors and manufacturers and can select appropriate partners that will offer customized solutions catered to your project.

About Johnson Controls:

We are in the business of building efficiency. We create buildings and environments that help people achieve. We do that by delivering healthier environments. Energy savings. Operational savings. And sustainable solutions for our partners all over the world. In fact, we serve over 1 million customers and some of the most iconic spaces in the world.