

**UNITED STATES EMBASSY  
Abuja, Nigeria  
CASE STUDY**



**LOCATION:** Abuja, Federal Republic of Nigeria, Africa

**SYSTEM**

**CONFIGURATION:** 20 ProgressivTube® (PT—50) ICS Units  
One electric backup storage tank system

**COLLECTOR FOOTPRINT:** 640 SF

<b>System Performance:</b>	<b>574,000 Btu/Day [168 KWH/Day]</b>
<b>Total Hot Water Heating Loads:</b>	<b>Max/Hr: 286 Gal/Hr</b>
	<b>Av/Day: 1080 Gal/Day</b>
	<b>Max/Day: 2980 Gal/Day</b>
<b>Water Heating Requirements:</b>	<b>Input Level: 77 deg F</b>
	<b>Max Temp Req. 140 deg F</b>
<b>Solar Provision (%) of Daily Load:</b>	<b>Daily Average Load 101 %</b>
	<b>Daily Maximum Load 36.4%</b>

**Project Background**

In 2001, the United States State Department decided to relocate the Nigerian embassy to Abuja and selected the Berger Group as part of a joint venture with DMJM to take part in the design and construction of a new compound. Berger prepared civil, geotechnical, mechanical, electrical and sanitary designs, to enable self-sufficiency.

As part of the goal toward energy self-sufficiency, project managers enlisted **Solar Direct** to design and deliver a solar water heating system for the 5-story, 90,000 SF Chancery Building within the compound. The building’s water heating requirements are mixed-use including 190 offices, a cafeteria and five live-in apartments for visitors. Solar water heating, in reducing the use of fossil-fuel based electricity succeeded in reducing the overall system load and therefore required size of the compound’s independent power plant.

What motivated the State Department’s investment in solar water heating? Electricity is a precious resource in almost all West African countries, where black-outs are routine due to little investment and maintenance, leaving the infrastructure creaking at the seams. ***Nigeria, a prime example, operates at one-third of its installed capacity*** due to aging equipment. Nigeria has become one of the world's leading consumers for stand-by generators.