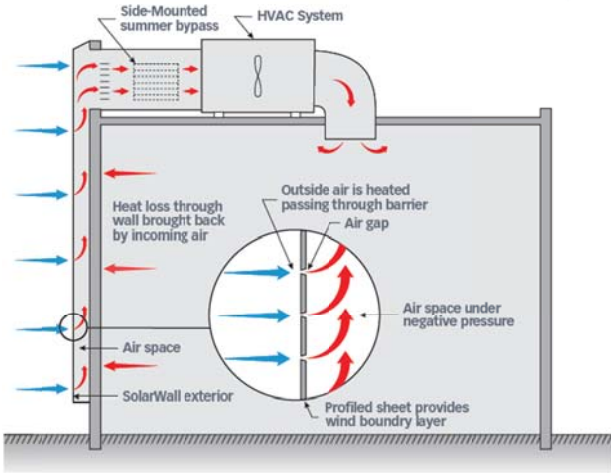


Example name: **Wal-Mart, Denver, CO, USA**

Template completed by: <i>Constantinos Vassiliades,</i> <i>vassiliades.constantinos@ucy.ac.cy</i> For installations BISTS Location: <i>Denver, Colorado, USA,</i> <i>39°44'21"N 104°59'5"W</i> Climate Type: <i>Dfc</i> Building Use: <i>Commercial Building</i> Level of BISTS integration 3. <i>Adding to the architectural image</i> ☒ New Build ☐ Refurbishment ☐ Other: <i>tick all that apply</i>	<i>Photographs</i> 
Type of BISTS: Active/Passive/Hybrid <i>delete as appropriate</i> Function(s): ☒ Air heating ☐ Water heating ☐ Combi-system ☐ Cooling/ventilation/shading ☐ PV/T ☐ linked to another system (e.g., heat pump) ☐ Other: <i>tick all that apply</i> Building element: ☒ Facade ☐ Roof ☐ Other: <i>tick all that apply</i>	<i>Drawings/Sketches/Cross-sections</i> 
BISTS characteristics: <i>The metal sheets forming the outer southern wall of the Supercenter, serve dual purpose as they can also act as a solar air heater. These are about 745 m² gray SolarWall panels. The metal panel heated in the sun, and the ventilation fans draw the heated air from the surface of the wall through the perforations in the panel, and guide it in the specially designed ventilation channels. This solar heated air is then distributed throughout the building.</i>	

Stage of Development: Responsible: Company.

- | | | |
|----------------------------------|---------------------------|-----------|
| ☐ | Idea/Patent | |
| ☐ | Prototype | |
| ☐ | Demonstration | |
| ☐ | Integral building element | |
| ☒ | Commercially available | SolarWall |

*tick all that apply***BISTS description and context**

It is basically a second shell which is mounted on the outer walls of the building, and heats the air and then leads it inside the building.

System viability

This "natural" heating of fresh air means that less natural gas is required to heat the ventilation air to maintain a high level of indoor air quality. The wall also serves as a solar shield, reducing solar gains, and hence the need for cooling in summer.

The SolarWall panels reduce the annual energy consumption in the Wal - Mart Supercenter by 1,325 million BTUs (388.000 kWh), and save the store about \$ 20000 per year (gas prices for 2005).

Modelling and simulation tools developed/used

For example.....new modules/types created for established simulation programs, stand-alone modelling, use of generalised codes, model outcomes, validation and accuracy. Design tools developed

BISTS Performance data Based on: ☐ Estimation ☐ Detailed simulation <i>CANMET's monitoring report.</i> ☐ Measurement/testing ☐ Long-term monitoring <i>tick all that apply</i> Performance parameters For integrated systems: key performance indicators - <i>Solar savings fraction: %</i> <i>Light transmittance: %</i> <i>Solar transmittance: %</i> <i>Total solar energy transmittance: %:</i> <i>Solar heat gain factor: %</i> <i>Building fabric U-values: W/m²K</i> <i>Noise, fire, etc ratings</i> <i>Other:</i> For separate collectors: performance rating coefficients - (EN12975, a₀,a₁,a₂), ASHRAE, etc Other:	<i>Graphs for collector efficiency, seasonal energy gains, diurnal/seasonal solar fraction, etc.</i>
Additional information:	
Sources and references: <u>http://solarwall.com/media/download_gallery/SolarWall_SellSheet.pdf</u> <u>http://solarwall.com/media/download_gallery/cases/Wal-Mart_Y05_SolarWallCaseStudy.pdf</u>	

INSTRUCTIONS

Please fill in as much information as possible.

Tick where appropriate.

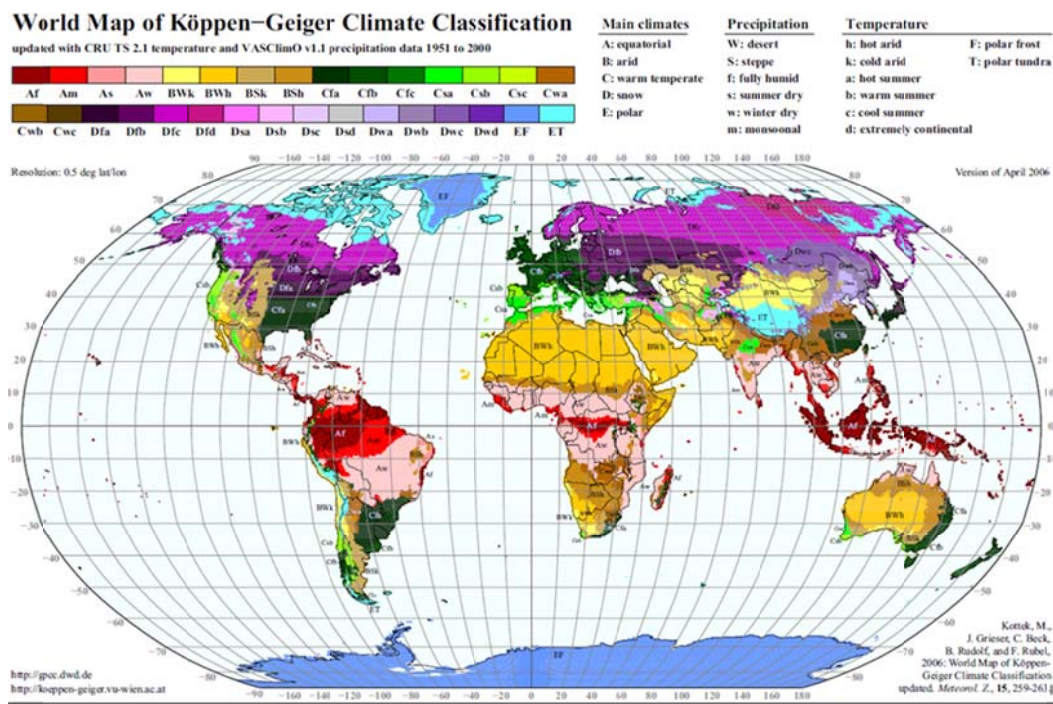
Text in red is suggested guidance. Insert information in provided space, removing red text as appropriate

If possible, use metric values.

If necessary, supply additional information on separate sheets

Reference listing

Köppen climate classification



(Kottik, M., J. Grieser, C. Beck, B. Rudolf, and F. Rubel, 2006: World Map of Köppen-Geiger Climate Classification updated. *Meteorol. Z.*, 15, 259-263.)

Reijenga classification

The integration of PV systems in architecture can be divided into five categories:

1. Applied invisibly
2. Added to the design
3. Adding to the architectural image
4. Determining architectural image
5. Leading to new architectural concepts.

(Reijenga, TH and Kaan, HF. (2011) PV in Architecture, in Handbook of Photovoltaic Science and Engineering, Second Edition (eds A. Luque and S. Hegedus), John Wiley & Sons Ltd, Chichester, UK)

Rush classification

The architectural/visual expression of building services systems are identified as:

Level 1. Not visible, no change

Level 2. Visible, no change

Level 3. Visible, surface change

Level 4. Visible, with size or shape change

Level 5. Visible, with location or orientation change

(Rush, RD. (1986) The Building systems integration handbook Wiley, New York, USA)

Collector test standards

BS EN 12975-2 2006 'Thermal solar systems and components solar collectors - Part 2 test methods'

ASHRAE Standard 93-2010 'Methods of Testing to Determine the Thermal Performance of Solar Collectors'

ASHRAE Standard 95-1987 'Methods of Testing to Determine the Thermal Performance of Solar Domestic Water Heating Systems'