Energy & Financial Savings Analysis

12/01/10

Olof Hallström
ClimateWell AB
Instrumentvägen 20, 126 53 Hägersten, Sweden
Telephone: +46 8 794 03 70
info@ClimateWell.com
www.ClimateWell.com

Name:	**Stefano Bertolini**
Company:	**Thermics**
Project:	**-**
Type:	**Single Family Dwelling**
Location:	**Sassari IT**
Study #:	**-**

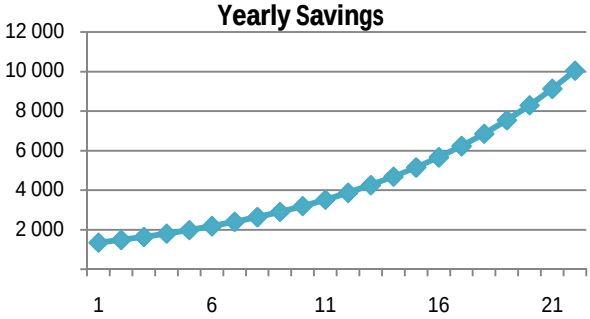
Dear Mr. Stefano Bertolini,

Thank you for your interest in ClimateWell, sustainable energy and reducing carbon dioxide (CO_2) emissions.

Annually, ClimateWell will help you save 1 357 EUR, reduce 85% of your energy needs and cut carbon dioxide emission by 6 778 kg.

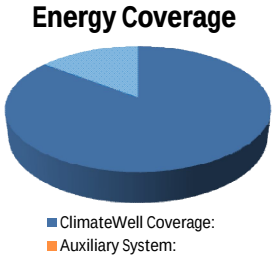
Financial Study

Annual Savings:	**1 357 EUR**
Average Monthly Savings:	**113 EUR**



Breakdown Summary

	Energy Saved (kWh)	Reductions (%)	Savings EUR
Cooling	8 351	100%	626
Heating	4 652	66%	399
Domestic Hot Water	3 873	88%	332
Total		**85%**	**1 357**



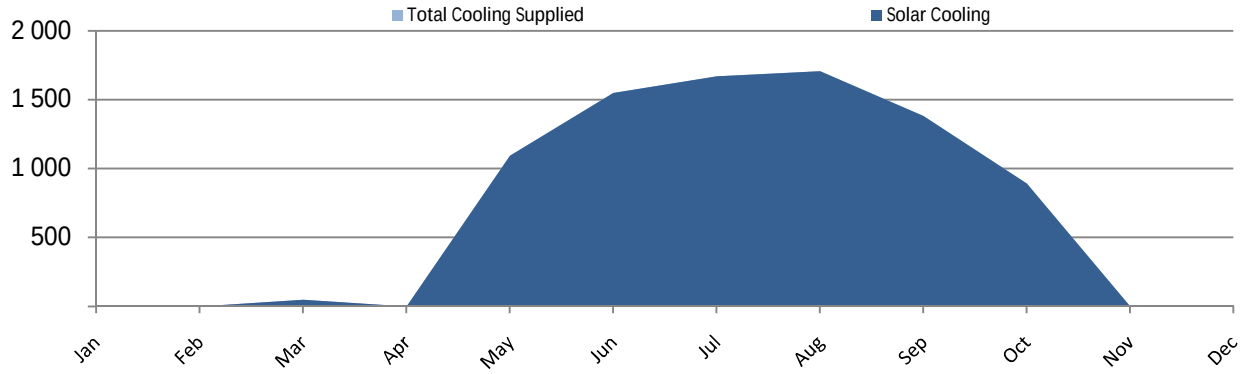
ClimateWell Coverage: 85%
Auxiliary System: 15%

Environmental Impact

By choosing the ClimateWell system, you will save 6 778 kg of carbon dioxide annually which is the equivalent of 2 912 liters of gasoline per year.

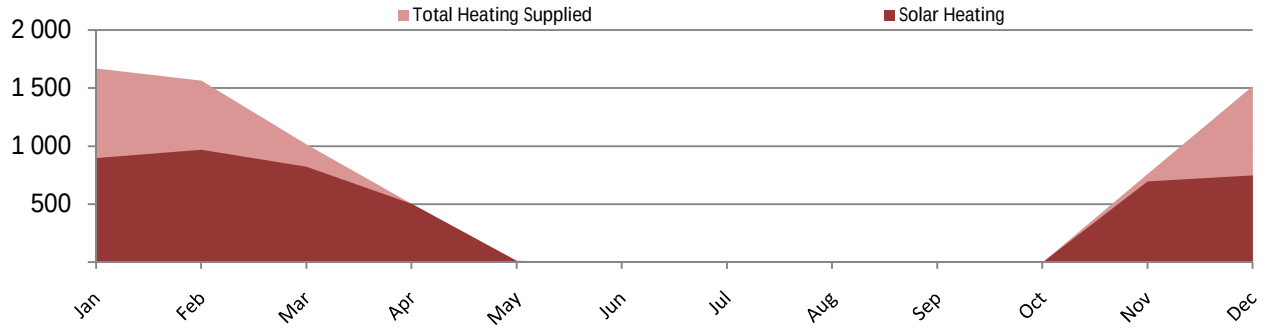
Cooling Solution

The ClimateWell system will save you 626 EUR per year, by covering 100% of the total cooling supplied.



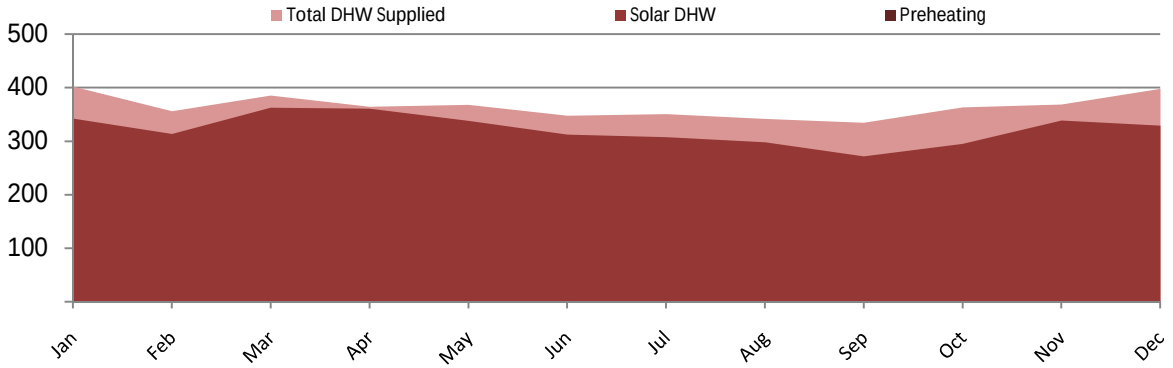
Heating Solution

The ClimateWell system will save you 399 EUR per year, by covering 66% of the total heating supplied.

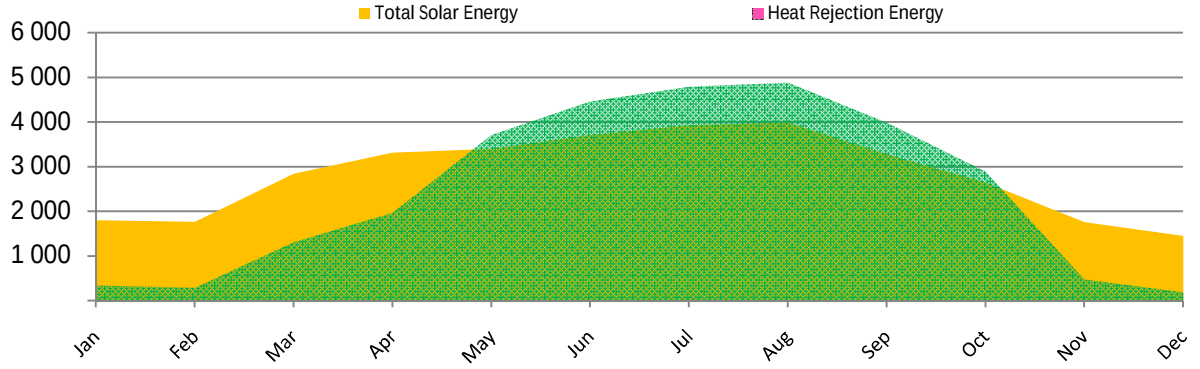


Domestic Hot Water (DHW) Solution

The ClimateWell system will save you 332 EUR per year, by covering 88% of the total DHW supplied.



Solar and Heat Rejection Energy



In-Depth Analysis Output

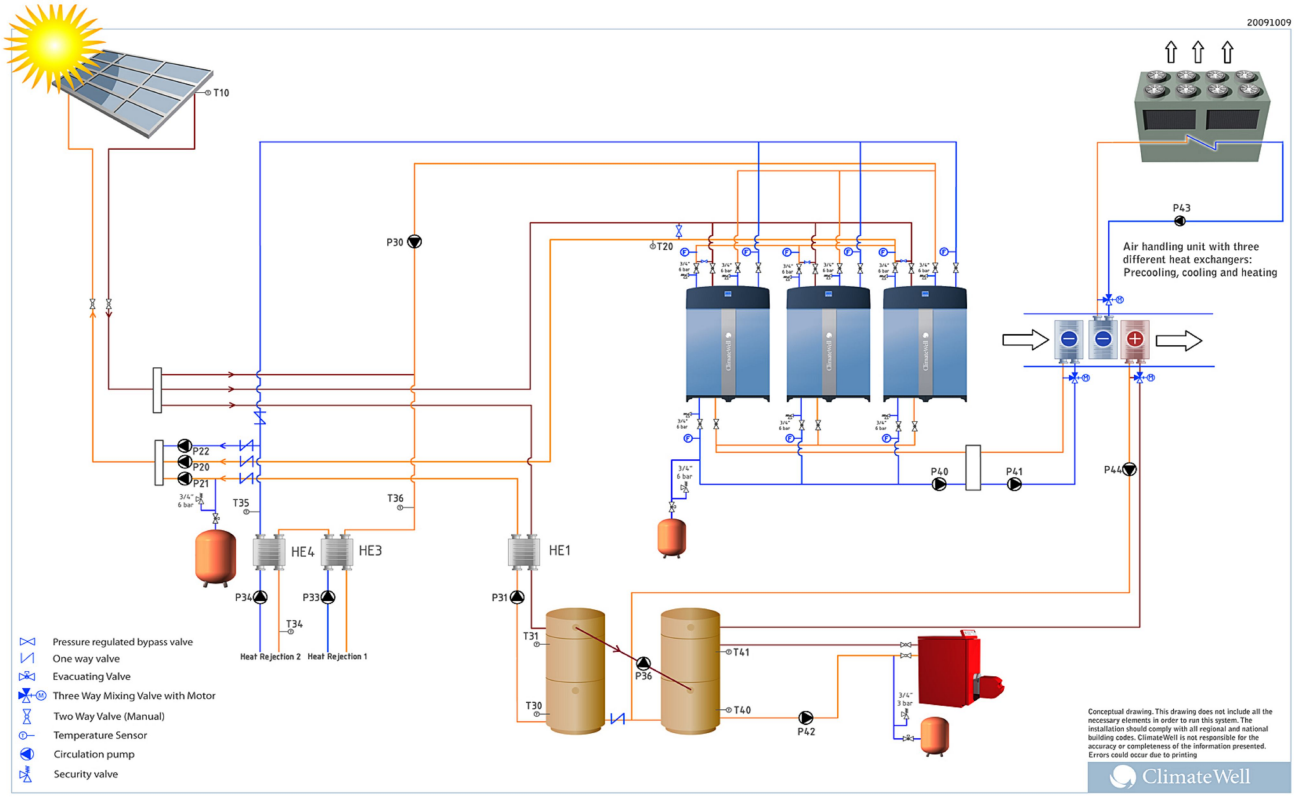
Annual Results without ClimateWell

	Heating	DHW	Cooling	TOTAL
Total Energy Supplied (kWh)	7 045	4 384	8 351	19 780
Total Energy Supplied (kWh/m2)	47	29	56	132
Emissions of Carbon Dioxide (kg)	1 912	1 190	4 463	7 566
Emissions of Carbon Dioxide (kg/m2)	13	8	30	50
Primary Energy Used (kWh)	10 065	6 263	13 918	30 246
Cost (EUR)	604	376	626	1 606

Annual Results with ClimateWell

	Heating	DHW	Cooling	TOTAL
Renewable Energy Delivered (kWh)	4 652	3 873	8 351	16 876
Auxiliary Energy Delivered (kWh)	2 393	511		2 904
Emissions of Carbon Dioxide (kg)	650	139		788
Primary Energy Used (kWh)	3 419	730		4 148

The ClimateWell System



Input Data

Economic Data

Fuel Cost (/kWh)	0.06	EUR
Electricity Cost (/kWh)	0.15	EUR
Annual energy cost increase	10%	
Interest on Mortgage	5%	
Mortgage (years)	15	

Building Data

Heating/Cooling Surface Area (m2)	150	Internal Gains (kW)	0.8
Transmission Loss Coefficient (W/K)	283	Air Changes (ach)	1.0
Thermal Mass (MJ/K)	60	Number of People	4
Design Temperature Cooling (°C)	35	Design Temperature Heating (°C)	20
Design Temperature Solar Cooling (°C)	22		

ClimateWell

ClimateWell 20 Units	**1**

Heat Source

Type of Heat Source	**Solar**
Solar Field Aperture Area (m2)	30
Manufacturer	Thermomax
Model	DF100 30
Inclination (°)	30
Orientation (°)	0

Primary Heat Sink

Outdoor Swimming Pool	
Pool Area (m2)	30.0
Pool Volume (m3)	45.0

Distribution System

Type	Air Duct 12/17°C
Heat Transfer Coefficient (W/K)	765
Distribution Flow (kg/hr)	1 751

Heat Exchangers

Heat Exchanger Distribution (kW)	10
Heat Exchanger 1 (kW)	9
Heat Exchanger 4 (kW)	31

Domestic Hot Water (DHW)

DHW Consumption (L/day)	240
Delivery Temperature (C)	55

Thermal Storage

DHW Storage (m3)	0.1
Heating Storage (m3)	0.4

Misc.

Carbon Dioxide/Electricity Conversion (kg/kWh)	1.069
Carbon Dioxide/Heat Conversion (kg/kWh)	0.190
Average Overall Chiller Efficiency	2.0
Average Overall Boiler Efficiency	70%
Heat to Electricity Conversion	0.3

Observations

-

-

-

-

Disclaimer

TRNSYS

The analysis is based on a dynamic simulation in TRNSYS, a dynamic simulation tool commonly used by engineers all over the world to make energy calculations. ClimateWell AB and its partners do not guarantee the accuracy or completeness of TRNSYS and/or any other tools used in this analysis.

For more information about TRNSYS or to find foreign TRNSYS distributors please contact The Solar Energy Research Centre in Sweden (SERC).

Input Data

The input climate data is taken from the Swiss data base *Meteonorm* that includes hourly data of temperatures, radiation, relative humidity and wind speed.

Assumptions

The results of the analysis are directly affected by the quality and quantity of data collected. Inaccessible information and lack of customer data calls for assumptions in the input data. Please take a look at the Input Data page to see the data used in the analysis. It is assumed that coal is the basis for calculating CO_2 emissions on electricity. If nothing else is stated no shading effects have been contemplated for the solar collectors. The total energy supplied to the building is the sum of the energy delivered from solar and auxiliary system and does not necessarily equal the energy demand at a static set temperature.

Legal Disclaimer

No warranty or representation is made by ClimateWell AB and its partners as to the accuracy or completeness of the information contained herein, and nothing contained herein is or shall be relied upon as a promise or a representation as to the future. Each and any potential partner, distributor, customer or investor in ClimateWell AB must conduct and rely on its own evaluation of the company, its technology and products.

This is not a quote for any products offered by ClimateWell AB or its partners.