

3. Méthodologie de simulation & Calculs

Amin CHTIOUI
GIZ-DMS

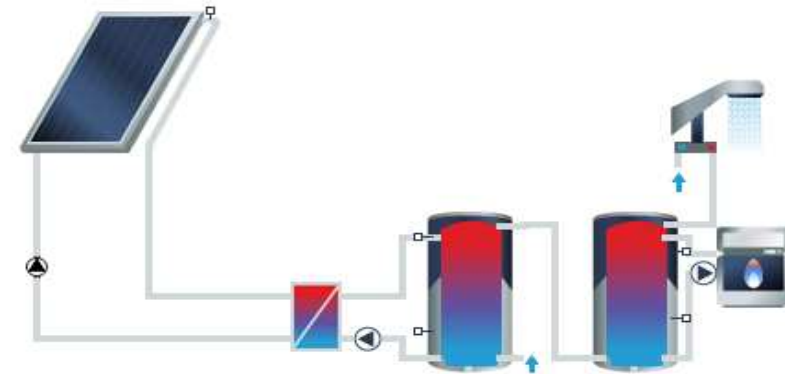


Définition du système – T*Sol

2



- Choix de la localisation:
 - Tunis
 - Djerba
 - Sfax
- Choix des composantes
 - Type du réservoir et volume
 - Type du capteur
 - Capteur plan
 - Capteur à tubes sous vides
 - Capteur Fresnel
- Identification de la demande
 - Chauffage de l'eau sanitaire, chauffage des locaux
 - Piscines
 - Chauffage des procédés, Génération de vapeur



Ex: Chauffage de l'eau sanitaire

Définition de la demande : Chauffage de l'eau sanitaire - CES

Hot water consumption

Parameters Circulation Operating times

DHW recirculation loop used

Consumption

Temperature

Consumption

Detached

Date: 2.12.

Definition of operating times

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

In operation

Mon

To change multiple days, click on the days in the calendar.

Hospital

Parameters

Description: Hospital

Time profile

Monday Tuesday Wednesday Thursday Friday Saturday Sunday Throughout week Over year

100 x

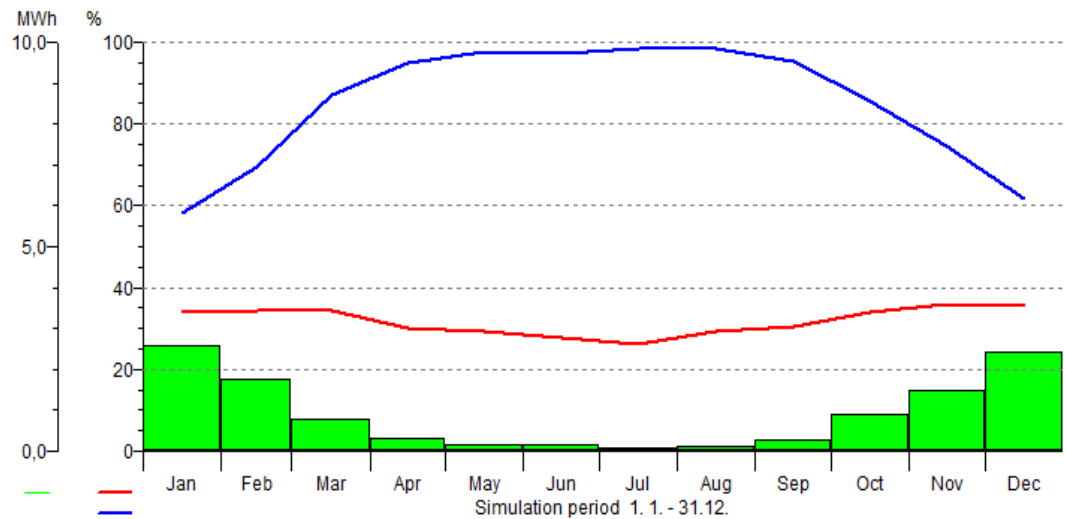
Jan	100,00
Feb	100,00
Mar	90,91
Apr	90,91
May	81,82
Jun	81,82
Jul	72,73
Aug	81,82
Sep	81,82
Oct	90,91
Nov	100,00
Dec	100,00

Standardize

Résultats principaux de la simulation



- Efficacité solaire;
(% d'utilisation de l'irradiation solaire)
- Fraction solaire;
(% de couverture du solaire de demande de chaleur)
- Le gain solaire annuel (kWh/an)



— Efficiency 31 % — Total sol fraction 85 %
■ E Aux heating 11,0 MWh

Paramètres économiques – Outil Excel



Subject	Value	Unit	Comments
Number of collector size variations	10	-	1 <= count <=10
Number of buffer size variations	9	-	1 <= count <=10
Specific Collector Area	1	m ²	
Free Tank Volume	10000	l	e.g. existing tanks as solar buffer
Fix Costs	0	TD	e.g. additional investments for tanks
Specific Tank Costs	2810	TD/m ³	
Subsidy rate	300	TD/m ²	
Operation & Maintenance Costs in % of Invest	1%		
Specific Pump Demand	3	kWh/m ²	given
Boiler Efficiency	88%		
CollectorType	FPC		FPC/CPC/LFC
Period under Consideration (=life span)	20,0	years	
Interest on Capital Factor	106%		100%+interest on capital
Energy Costs:			
Electricity	107	TD/MVAH	MVAH=1000/kVAH

Paramètres économiques - Outil Excel



	Energy Costs: year 1-6	110%		incr. rate factor
	Energy Costs: year >=7	105%		
	Degradation	0,50%		
	Credit Capital			
	Percentage of Investment	0,00%		0%-100%
	Credit interest rate	6,00%		>=0%
	Grace period	5	years	>=0
	Total credit period	10	years	> Grace Period
	Present Value of Credit	100,0%		% of credit sum
	Credit Cash Flow	148,7%		% of credit sum
	Product Prices per Collector Area	1000		
	Total Collector Area	840		
	100 m ²	630	TD/m ²	
	1000 m ²		TD/m ²	
FPC	5000 m ²	1365	TD/m ²	
		1050		
	100 m ²	787,5	TD/m ²	
	1000 m ²		TD/m ²	
CPC	5000 m ²	1924	TD/m ²	
		1082		
	500 m ²	902	TD/m ²	
	2000 m ²		TD/m ²	
LFC	10000 m ²		TD/m ²	

Merci Pour Votre Attention