



SUNVALOR
Expertise Energie & Environnement

EINSTEIN in France

Thermal Energy audit of specialty paper drying process

SUNVALOR

SUNVALOR
Expertise Energie & Environnement

Energy audit

- SUNVALOR
- Energy audits in France, small and mid size requirements
- Ahlstrom, company presentation
- Drying process
- Energy balance
- Alternatives
- Economics

SUNVALOR

SUNVALOR
Expertise Energie & Environnement

Maitrise d'œuvre
Economie de la construction
BET Structure
BET VRD
BET Fluides et Energies
BET SSI
Direction des travaux
Développement HQE
Assistance à Maitrise d'Ouvrage

Etudes et conseil
Etudes thermique
Audit énergétique bâtiment
Audit Energétique Procédés industriels
Etudes de faisabilité Energie renouvelables
Bilan Carbone®
Impact environnemental




SUNVALOR

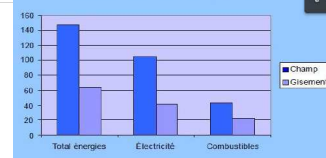
SUNVALOR
Expertise Energie & Environnement

EE in Rhône Alpes

- Small and mid size companies are vulnerable and see there energy intensity increasing aver last years
- Limited inhouse knowledge in energy efficiency
- Limited time dedicated for energy efficiency

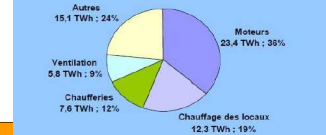
Source: énergie climat Rhône alpes:
Energy efficiency in industry 24fev 2011

Gisement total : 64,2 TWh soit 43 % de la consommation du champ étudié (147,7 TWh)



Catégorie	Champ (TWh)	Gisement (TWh)
Total énergies	~140	~140
Electricité	~100	~100
Combustibles	~40	~40

Les Moteurs et le Chauffage des locaux concentrent plus de la moitié du gisement total



Usage	Quantité (TWh)	Pourcentage
Moteurs	23.4	35%
Chauffage des locaux	12.3	19%
Autres	15.1	24%
Ventilation	5.8	9%
Chauffe-eau	7.6	12%

SUNVALOR

SUNVALOR
Expertise Energie & Environnement

Company presentation

AHLSTROM

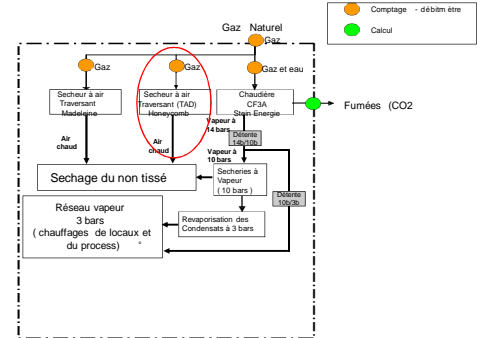
- 5700p and over 2bio€ sales
- AHLSTROM site, near Grenoble, 110p, 7500T
- European leader in specialty paper and adhesives with application in the medical sector, food and filtration...



SUNVALOR

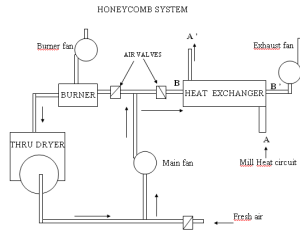
SUNVALOR
Expertise Energie & Environnement

Energy Audit: drying process



SUNVALOR

Energy Audit: drying process

SUNVALOR
Expertise Energie & Environnement

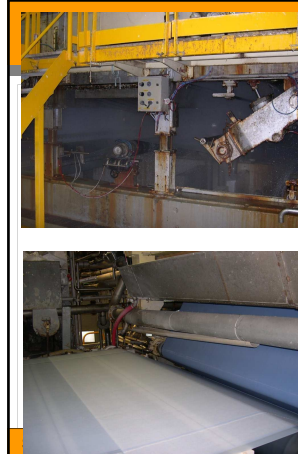
The Honey comb dryer
'THRU-DRYER'

- Air temperature
- Air flow
- Humidity

Better control of fresh air
inflow, pre heated
through a new HX with
hot humid air outflow
Better control of humidity in
the air system



SUNVALOR

SUNVALOR
Expertise Energie & Environnement

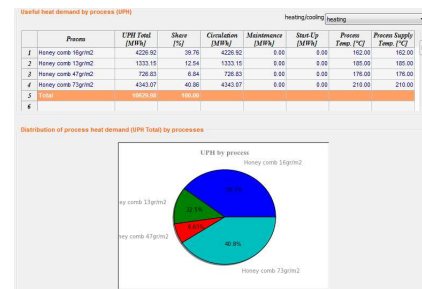
- Few issues

The line produces 250 grades
Grade produced use a wide variety of cellulose and synthetic fibers
Circa 3 grades changes a day
Matter flow difficult to model in this open system

- Few tricks

4 grades can replace 250
Temperature between 160 and 210°C
Output between 7000 and 12500kg/h (dry air)
Continuous batch, no start up and no maintenance,
no waste heat in the distribution duct

SUNVALOR

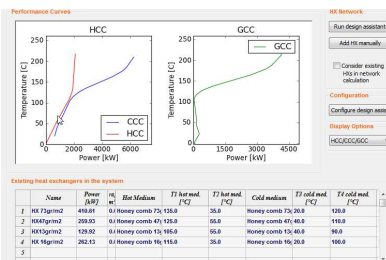
SUNVALOR
Expertise Energie & EnvironnementSUNVALOR
Expertise Energie & Environnement

SUNVALOR

Alternatives

SUNVALOR
Expertise Energie & Environnement

- HX
- CHP gas turbine
- Solar thermal
- HX+CHP



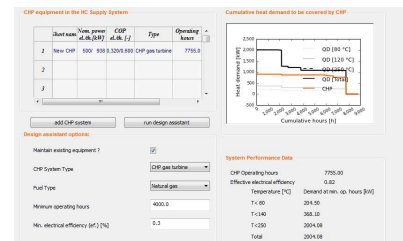
320Kw HX / 270m2
Pre heat inflow from 20 to 120°C in winter and from 40 to 110 in summer.

SUNVALOR

Alternatives

SUNVALOR
Expertise Energie & Environnement

- HX
- CHP gas turbine
- Solar thermal
- HX+CHP



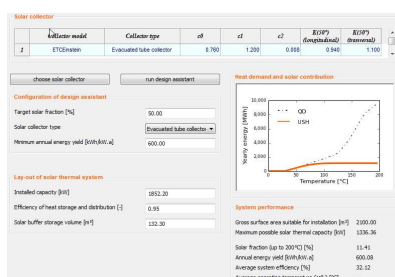
CHP gaz turbine 500Kw el / 938Kw th

SUNVALOR

Alternatives

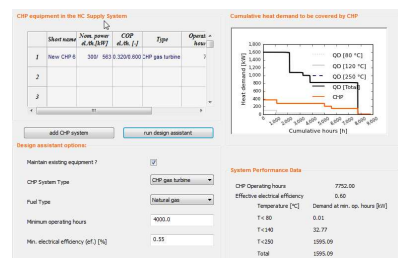
SUNVALOR
Expertise Energie & Environnement

- HX
- CHP gas turbine
- Solar thermal
- HX+CHP



SUNVALOR

- HX
- CHP gas turbine
- Solar thermal
- HX+CHP



CHP 300Kw el/563kw th +

SUNVALOR

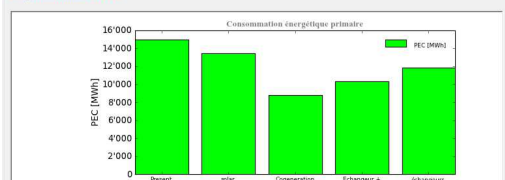
Energy consumption

SUNVALOR
Expertise Energie & Environnement

Consommation énergétique primaire (PEC)

Alternative	Consommation énergétique primaire (MWh)	Economies (MWh)	Economies (%)
1 Present State (checked)	15763.49		
2 solar thermal	13417.41	1534.47	10.26
3 Cogeneration	8809.75	6142.13	41.58
4 Echangeur + Cogeneration	10350.39	4601.50	36.78
5 échangeurs	11851.80	3100.08	20.73
6			

Comparaison relative de la PEC



SUNVALOR

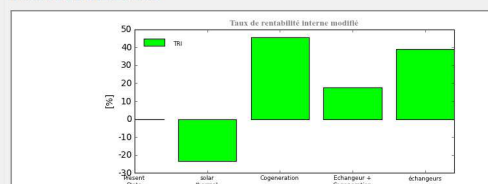
IRR

SUNVALOR
Expertise Energie & Environnement

Taux de rendement interne (TRI) modifié

Alternative	Taux de rendement interne modifié (%)	Délai de récupération [années]	Rapport coût-bénéfice
1 Present State (checked)			
2 solar thermal	-23.30	4.00	
3 Cogeneration	45.48	1.04	
4 Echangeur + Cogeneration	17.45	3.07	
5 échangeurs	38.92	1.51	
6			

Comparatif du taux de rendement interne



SUNVALOR

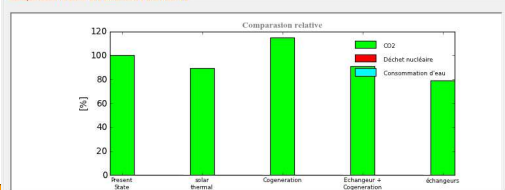
CO2 impact

SUNVALOR
Expertise Energie & Environnement

Impact environnemental de l'activité

Alternative	Production de CO2 (t)	Déchet nucléaire (tonnes Radiocif/dg)	Consommation d'eau (m³)
1 Present State (checked)	3388.46	0.06	0.00
2 solar thermal	3043.96	0.06	0.00
3 Cogeneration	3808.73	-19.40	0.00
4 Echangeur + Cogeneration	3002.56	-7.44	0.00
5 échangeurs	2893.59	0.00	0.00
6			

Comparaison relative des différentes alternatives



SUNVALOR

chosen alternative

SUNVALOR
Expertise Energie & Environnement

- The HX is being seized and included in the current investment
- CHP is the next step
- Air waste other drying system 200000m3/h to be retrieved

SUNVALOR

