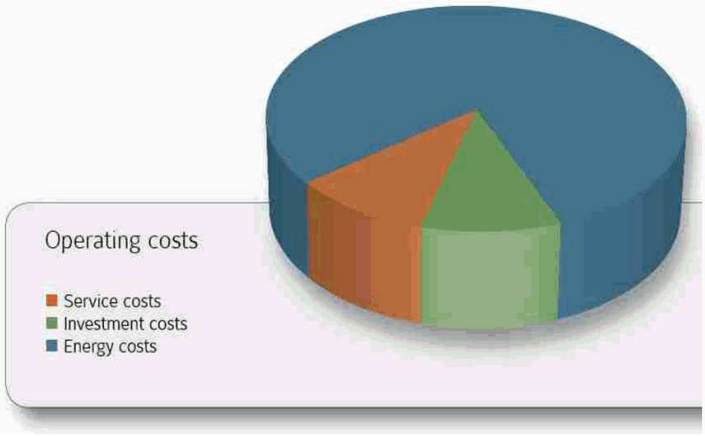
Life Cycle Cost comparsion (LCC)

Johnson Controls



Economy

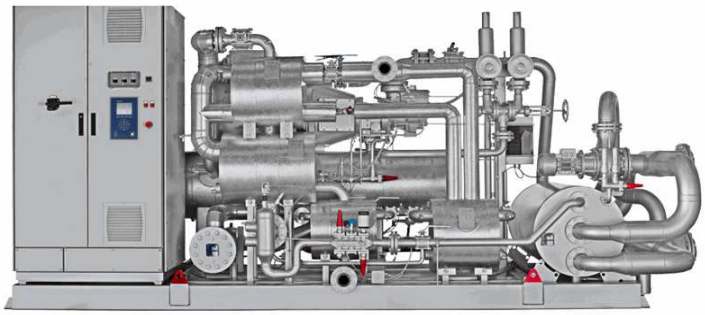
Do you want to increase your profit ...





Environment

... and at the same time reduce global warming?



SABROE
BY JOHNSON CONTROLS

Sabroe

Life Cycle Costs program

Version XXXXXXXXXX

Customer	: MECOM	Project No:	:	Page :	2
Project	: HUMENÉ	Prepared by:	: cHRAMOSTA		
Date	: 2022/02/11	Time	: 15.45.46		

Calculation assumptions

Energy price	DKK	1.500
Production life time	year	20.
Interest rate on total investment	%	7.0
Expected annual energy costs	%	3.0
Required cooling capacity	kW	709.
Operating hours/year	hr/year	6500.
Calculate energy used by pumps and fans		no
Calculate variable load profile		yes
Calculate heat recovery		no

Parameters for both solutions

Solution description		**Sabroe SAB 233L**	**Sabroe SAB 233L_VSD**
Refrigerant		R717	R717
Refrigerant charge	kg	0.	0.
Actual cooling capacity	kW	1210.	1504.
Operating hours/year (act. cooling)	hr/year	6500.	5274.
Shaft power consumption	kW	310.	386.
Motor efficiency	%	91.	96.
Supply power	kW	341.	401.
COP (incl. motor efficiency)		3.5	3.8
Energy costs			
Energy costs/year	DKK	2,185,206	1,869,479
Heat recovery first year	DKK	0.	0.
Net energy costs/year	DKK	2,185,206	1,869,479
Maintenance costs			
Maintenance costs first year	DKK	0.	0.
Maintenance costs increase	%/year	0.	0.
Enviromental costs			
Enviroment incl. ref. costs first year	DKK	0.	0.
TEWI value	CO_2/100 year	17,482	14,956
Lifetime results net present values			
Investment	DKK	1,150,000	1,350,000
Energy	DKK	29,697,638	25,406,812
Maintenance costs	DKK	0	0
Environmental costs	DKK	0	0
Total	**DKK**	**30,847,638**	**26,756,812**
Difference	**DKK**	**4,090,826**	
Approximate payback time for additional investment	**years**	**0.6**	

Sabroe

Life Cycle Costs program

Version XXXXXXXXXX

Customer	: MECOM	Project No:	:	Page :	3
Project	: HUMENÉ	Prepared by:	: cHRAMOSTA		
Date	: 2022/02/11	Time	: 15.45.46		

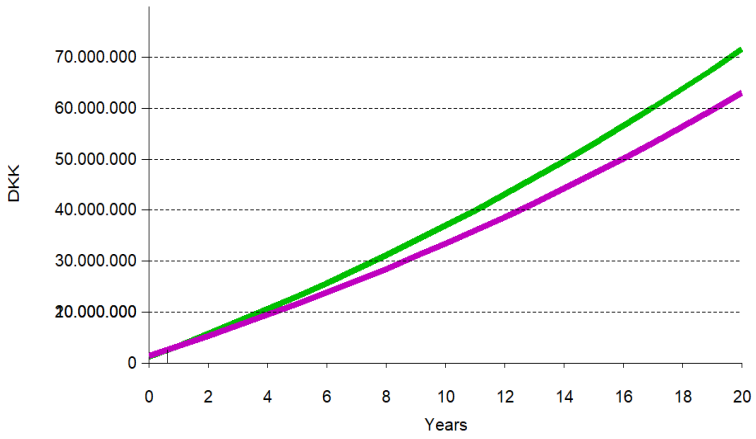
Sabroe SAB 233L

Sabroe SAB 233L_VSD

Life time results net present values (PV)

	DKK	DKK
Investment	1,150,000	1,350,000
Energy	29,697,638	25,406,812
Maintenance		
Environment		
Total	**30,847,638**	**26,756,812**

Accumulated actual costs



Crossing curves:

Approximate paybacktime for additional investment: **0,6 years**

Load Profile

Sabroe SAB 233L

Operating time		Capacity	Cool cap.	Supply pow.	COP
hr/year	%	%	kW	kW	
325.	5.	100.	1210.	341.	3.55
2470.	38.	75.	904.	263.	3.44
2925.	45.	50.	599.	199.	3.00
780.	12.	25.	293.	146.	2.01

Sabroe SAB 233L_VSD

Operating time		Capacity	Cool cap.	Supply pow.	COP
hr/year	%	%	kW	kW	
53.	1.	100.	1504.	401.	3.75
2215.	42.	75.	1128.	300.	3.76
2373.	45.	50.	752.	205.	3.66
633.	12.	25.	387.	115.	3.38

	Sabroe SAB 233L	Sabroe SAB 233L_VSD
Total used energy/year (kWh)	**1,456,804**	**1,246,319**
Total cooling energy/year (kWh)	**4,607,750**	**4,607,750**
Total operating time/year	**6500.**	**5274.**
Total operating time/day	**18.**	**14.**
Average COP	**3.16**	**3.70**