New Features and Improvements in energyPRO 4.6

List of improvements

64 bit

With energyPRO 4.6 energyPRO changes from a 32 bit program to 64 bit. The main advantage is better memory use. With 32 bit a maximum of app. 3 GB memory can be used by energyPRO regardless of the physical memory available in the computer. When calculating large projects running for many years you can experience out of memory issues. With 64 bit this limitation is gone and energyPRO can use all the available physical memory.

As a consequence of the 64 bit version, energyPRO 4.6 is installed in a different folder than energyPRO 4.5. energyPRO 4.6 is default installed in c:\Program Files\EMD\energyPRO 4\.
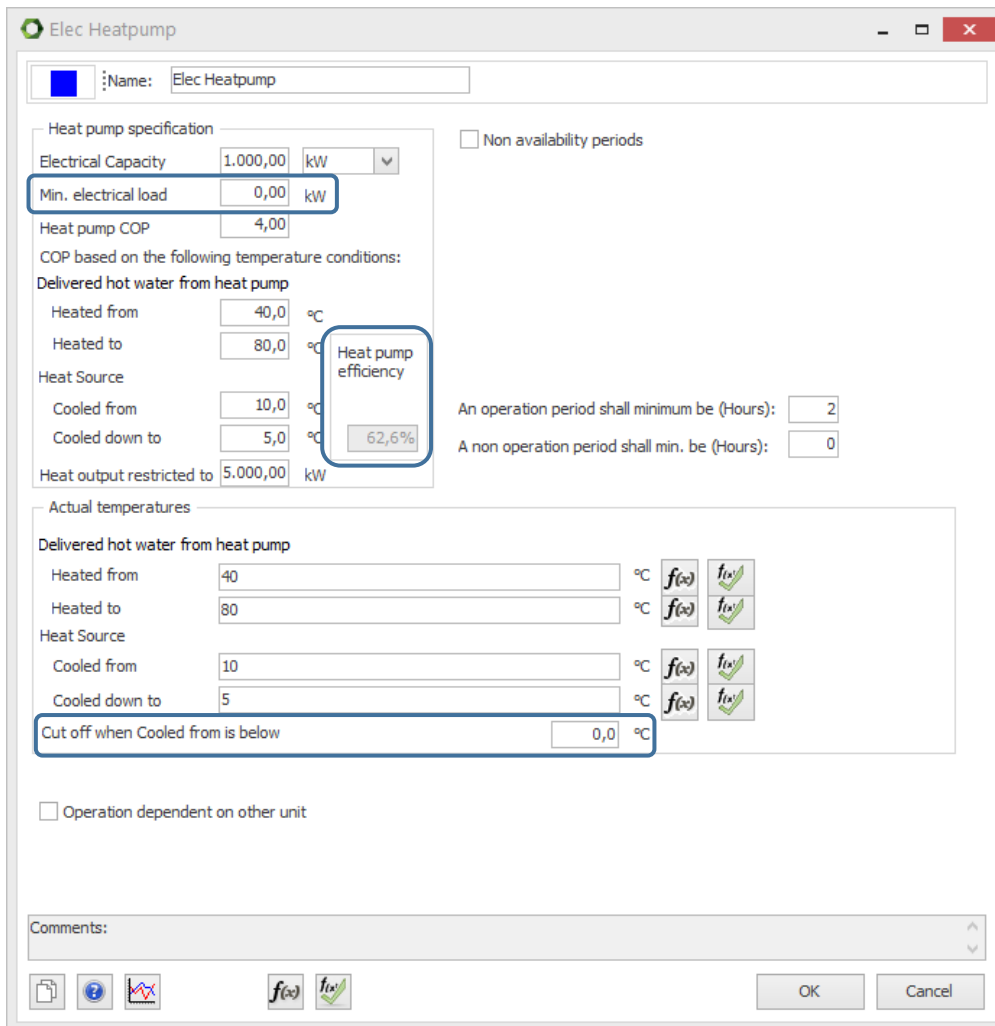
Heat pump improvements

A few improvements are made in the dedicated heat pump model.

When operating with part load, a minimum electric load can be specified.

When specifying the heat pump we now show the heat pump efficiency. The heat pump efficiency is the ratio between the stated COP and the theoretical maximal Lorentz COP.

Finally, it is now possible to set a cut off temperature. When the heat source temperature is below the stated value, the heat pump is not operating.

EMD International A/S
www.emd.dk

New report: Cash flow, annual in FINANCE

A new report is added to the list of reports when being in FINANCE.
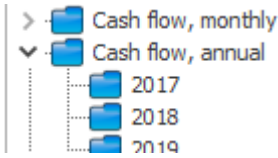

Similar to Operation income in DESIGN and Income statement in ACCOUNTS, the Cash flow, annual report shows the amount and price per unit as well as income or expenditure of the payment.

Cash flow, annual from januar 1, 2017 to december 31, 2017

(All amounts in EUR)

Revenues							
Sale of heat	:	12.069,8 MWh	at	30,0*	=	362.095	
Sale of electricity							
Day	:	10.136,7 MWh	at	55,0*	=	557.519	
Night	:	8,4 MWh	at	35,0*	=	294	
Sale of electricity Total							557.813
Total Revenues							919.908
Operating Expenditures							
Fuel costs							
Natural gas	:	2.738.217,8 Nm3	at	0,242*	=	662.649	
Fuel costs Total							662.649
Operation&Maint.							
Engine 1	:	6.276,9 MWh	at	6,0*	=	37.661	
Engine 2	:	3.868,2 MWh	at	6,0*	=	23.209	
Boiler	:	4.441,7 MWh	at	0,6*	=	2.665	
Operation&Maint. Total							63.536
Total Operating Expenditures							726.184
Net Cash from Operation							193.723
Investments							
Investment						1.000.000	
Total Investments							1.000.000
Total Interest on Cash Account							0
Cash Surplus							-806.277
Cash Account							-806.277

Draft comparison of key financial figures

When being in FINANCE or ACCOUNTS and COMPARE calculating multiple alternatives and 10 or 30 years can be a time-consuming task. We have added a new item under tools:
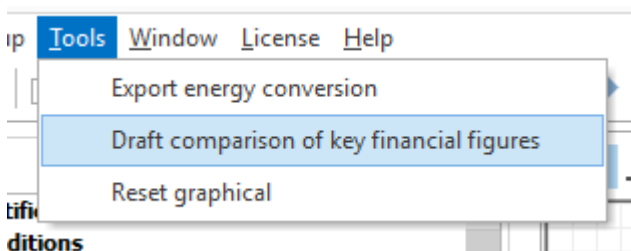
When selecting this item energyPRO calculates the first year of the Reference and all the alternatives and you have this table:

DRAFT comparison of key financial figures

		Reference	Heat pump alternative	Woodboiler alternative
Planning period			10 years	
Discount rate			3,00 %	
Investment	[mio. EUR]	0,00	1,50	1,00
Extra investment in alternative	[mio. EUR]		1,50	1,00
Yearly operation income	[mio. EUR]	0,05	0,27	0,17
Yearly improved operation income	[mio. EUR]		0,23	0,12
Net Present Value of investment	[mio. EUR]		0,46	0,02
Simple Pay Back Time of investment	years		6,52	8,33
Internal Rate of Return	%		8,63	3,46

It shows the stated investments and the calculated yearly operation income for the first year for reference and the alternatives. Based on the planning period and discount rate Net Present Values, Simple Pay Back time and Internal Rate of return is calculated. You are able to change the planning period and the discount rate and analyse the impact on the key financial figures.

Battery cycle counter

When defining a battery (or e-car), you can use a formula for setting the Max capacity of the battery.

In the formula, you can use the function cycles:

Formula

10-cycles/1000

Function to select	Unit	Description
External conditions		
DK1Spot17(_)	DKK/MWh	DK Vest Spotpriser 2017
Cycles		
Cycles		Counting the number of cycles equivalent to a full discharge
Math functions		
Min(function1;function2;function3;...)		Minimum of passed functions

One cycle is defined as a discharge from full capacity to empty battery. Similar two times discharge from full to half equals one cycle.

The number of cycles is accumulated and the capacity in a given month is based on the accumulated number of cycles by the end of the previous month as illustrated by this extreme example:
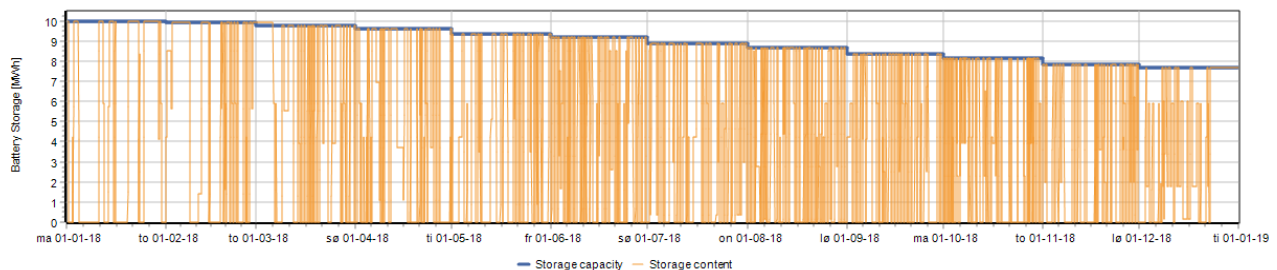

The accumulated number of cycles also appears in the energy conversion, annual and energy conversion, monthly reports:

Electric storage:

Battery
Charging   2.880,0 MWh-elec.
Discharging   -2.082,8 MWh-elec.
Change in storage content   -2,0 MWh (As potential elec. output)
Losses   -795,2 MWh-elec.
Full discharge equivalent cycle counter   245,0 Cycles

Reorganising menus including new shortcut buttons

We have made some changes in the menus including adding some shortcut buttons.
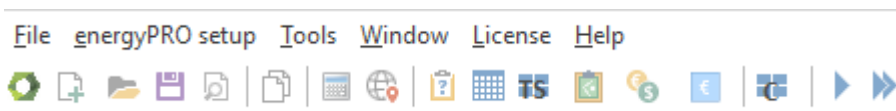
As it shows, the license now has a menu of its own. It is no longer under Help.

The new shortcut buttons give direct access to a number of input windows. The last two initiates a calculation. Below is shown where the shortcuts are linking to.

	Project identification
	External conditions
	Time series overview
	Operation strategy
	Economy
	Finance
	COMPARE overview
	calculate
	calculate all in COMPARE

Reorganising List of function and Check formula buttons

In energyPRO 4.5 the location of the buttons List of function and Check formula is located close to the formula field. However, with more and formula fields, it becomes difficult to have room in the windows for the buttons.

In energyPRO 4.6, the buttons are visible in the bottom of the window, when being in a formula field.

Also when being in a formula field a double click will open the List of functions.

Improvements in German CHP law

Many text strings have been updated, some functions are renamed and messages are shown, to improve the understanding of how to use the functionality.

The special functions for the German market according the current legal situation help to include e.g. a "KWK-Zuschlag" or a "Marktprämie" into energyPRO. There is a new tutorial how to use these functions on the German website.