

News in energyPRO 4.8

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Introduction

This first energyPRO 4.8 release contains several improvements. This paper describes some of them.

Licence registration by serial number

With energyPRO 4.8 you can activate either by the licence file as always, or by a serial number.

energyPRO registration

License file

The license file opens those modules for which you have bought a licence. Additionally, the file holds information on the licence holder, such as customer number, company name, etc. that will appear on all reports produced from energyPRO.

Serial Number

License file

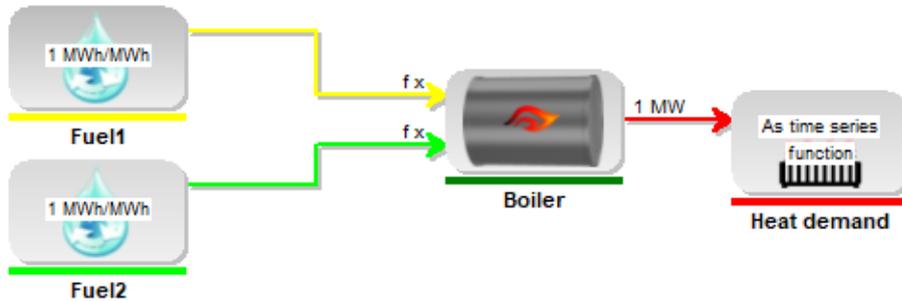
The serial number can be copied from the newsletter or the licence e-mail and pasted into the window above. If instead you have received a licence file, it should be saved on your computer from your e-mail program and selected using the Browse button from the screen above.

This serial number is valid for your company and will be the same for future activations of energyPRO.

More fuels on energy conversion units

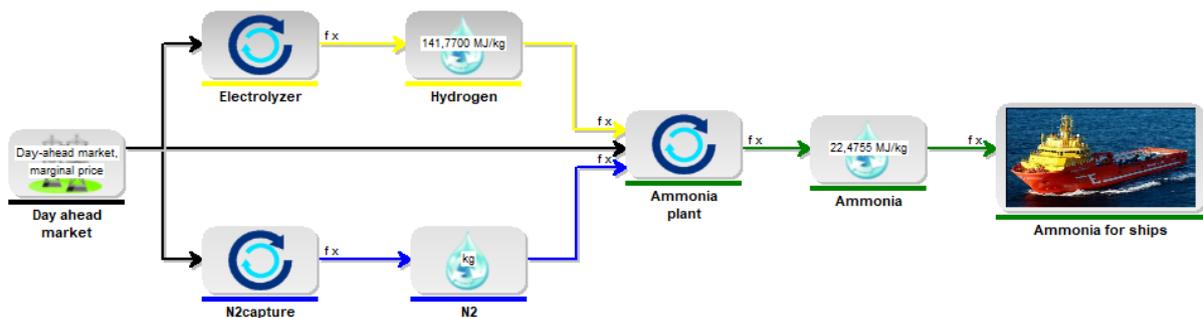
This is one of the big improvements in energyPRO 4.8. Until energyPRO 4.8 you could only specify one fuel as input and another as output on an energy conversion unit.

With energyPRO 4.8, you can specify more fuels. This can be used for dual fuel units:



And it is very useful when working with PtX projects or complex industrial projects.

In energyPRO 4.8, we have included some PtX examples. This is an example of an ammonia production plant, where the Ammonia plant, in addition to electricity, uses hydrogen and N2 to produce Ammonia:



Opening the Ammonia plant, you can see that two fuels are selected in the Fuel input:

Ammonia plant

Name: Ammonia plant

Technical | **Operational**

Production unit type: User defined

Fuel input(s): Hydrogen;N2

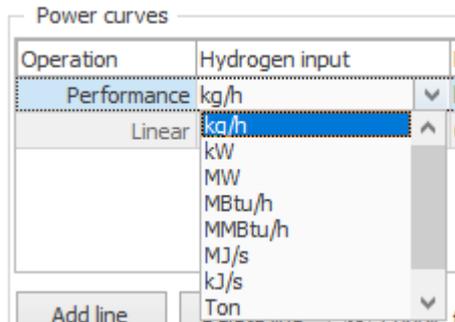
Fuel output(s): Hydrogen, Ammonia, N2

Power curves

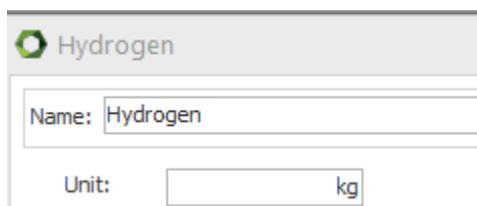
Operation	Hydrogen input	N2 input	Electricity input	Ammonia output
Performance	kg/h	kg/h	MW	kg/h
Linear	0,178*AmmoniaCap(_)	0,822*AmmoniaCap(_)	0,01*AmmoniaCap(_)	AmmoniaCap(_)

In the power curves the names of the fuels are shown in the header.

Another improvement is that you can select the unit of the fuel and not only a measuring unit:



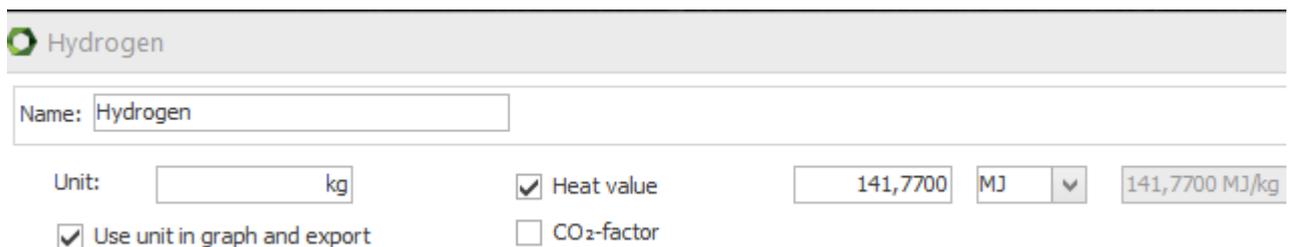
In this case the unit of the fuel Hydrogen is kg:



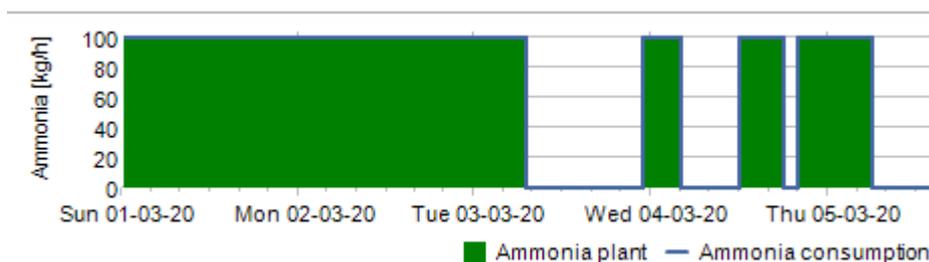
Heat values and CO2 factors on fuels

In some cases, fuel in energyPRO is not necessarily used to be burned. You can use fuel to simulate any type of product included in the simulation. In the above PtX example, nitrogen is included in process of producing Ammonia. In other cases, it can be water for hydrogen production or CO2 for methanization.

In these cases, it makes no sense to define a heat value. Therefore, you can now disable the heat value and as well the CO2-factor:

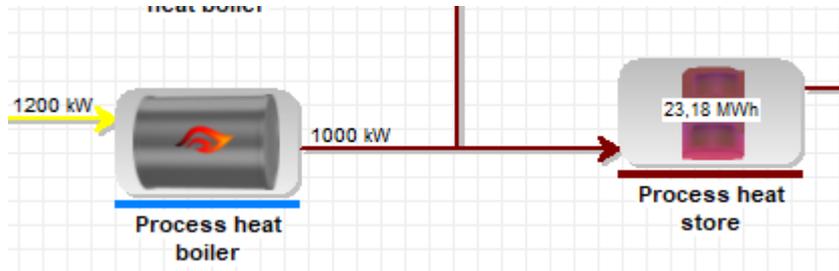


Further, you can choose to have the consumption or production of the fuel shown in the fuel unit instead of the measuring unit in graphs and export energy conversion.



Process heat storage

It is now possible to add a process heat storage in energyPRO. The process heat storage is very much like the thermal heat storage, where you can define the capacity by the top and bottom temperatures and where the heat capacity of water is used.



Setting storage capacity directly

In some cases, it doesn't make sense to use temperatures at top and bottom of storage and heat capacity of water to specify the capacity of a storage.

Now it is possible to user define the capacity. At the top of Thermal heat, Process heat and Cooling storages, you can specify that you want to define the capacity directly:

The screenshot shows the configuration interface for a 'Process heat store'. The title bar reads 'Process heat store'. Below it, there is a text input field for 'Name' containing 'Process heat store'. A checkbox labeled 'User defined storage' is currently unchecked. Below that, there is a 'Volume [V]' section with a text input field containing '1000,0' and a unit dropdown menu set to 'm³'.

When enabling User defined storage, the storage form looks like this:

 Process heat store

Name:

User defined storage

Storage capacity
 MWh

Storage Loss

Formula for loss at full store

Formula for loss at empty store

You define the storage capacity by a formula and likewise the storage losses.

Setting storage content at start and end

Up till now, you have only been able to set the storage content at start and end of calculation in the OPERATION module.

Now, this feature is available also when being in DESIGN, FINANCE or ACCOUNTS.

Name:

User defined storage Non availability periods

Volume [V]
 m³

Temperature in the top [Tt]
 °C

Temperature in the bottom [Tb]
 °C

Utilization
 %

Storage capacity :
 MWh as of 01-01-2018

Minimum storage content in % of storage capacity
 % MWh

Storage content at start and end of calculation MWh

By default, thermal heat, process heat and cooling storages start and end empty. However, if you have specified a minimum storage content, the storage will by default start and end at that. This is expressed by the function MinContent.

Likewise, if you want the storage to start and end with full content, you can use the function FullContent:

Storage	
MinContent	Minimum storage content
FullContent	Full storage content

If you want the storage to start and end with half content you can write a function like this:

Storage content at start and end of calculation MWh

Demand as time series function

We have added an option on the demands:




When clicking the As timeseries function button, the demand form looks like this:

Heat demand

Name: Heat demand

Development of Demand in Planning Period

Demand as time series function

Symbol:

Unit: ▼

Function:

In the function field, you can include time series, time series functions and make formulas.

The advantage of heat demand as time series function is the option of including time series with more years, instead of only having one year.

IsHoliday

A small but useful improvement. In External conditions, you are able to specify public holidays. Until now, the public holidays have only been accessible when setting up electricity markets on fixed tariffs.

With energyPRO 4.8, we have included a new function in the list of functions, IsHoliday:

Date and Time functions	
year(_), month(_), day(_), hour(_), minute(_)	Returns corresponded part of date-time
DayofWeek(_)	Returns the day of the week, 1 = Monday, 7 = Sunday
IsHoliday(_)	Returns 1 = Holiday 0 = Not Holiday

With this you have the option of including public holidays in time series functions, demands, energy conversion units, etc.

German private wire payments and coverage tables on more markets

When enabling prioritizing of electricity demands for the German CHP law, you have access to German private wire payments and in the energy conversion, annual report, you have coverage of electricity tables.

With energyPRO 4.8 these functions and tables also work with multiple markets.