



# EFOY Pro Fuel Cells

## New Generation

Confidential Information





**45,000**  
Fuel cells sold  
worldwide

Sales  
**58.5 million**

**282**  
Employees

Distribution  
partners  
worldwide

**4**  
Locations

- Brunnthal (HQ)
- Calgary
- Almelo
- Cluj



# SFC Energy

## in the world of energy supply in industrial applications



© NVE The Norwegian Water Resources and Energy Directorate

Customers do have high requirements for their energy supply.



# Customer behavior and expectations



Focus on environmentally friendly solutions



100% reliable energy supply



Savings in personal and logistic costs



Long autonomy and low maintenance



Permanent connectivity

# Customer demands on energy supply in industrial application



High Power



Cost efficient



Flexibility



Reliability



Eco-friendly



High autonomy



Quiet



Convenient



Connectivity



always available



© Hydro2Power

# The new energy solution from SFC Energy

## EFOY Hybrid Power



# EFOY fuel cell

## Connecting components

### EFOY Cloud



Ethernet



EFOY Fuel Manager



Control Panel



myEFOY App






EFOY Li Battery

# The new energy solution from SFC Energy




## EFOY Hybrid Power

### EFOY Fuel Cell




-  Extended life time  
higher power
-  More flexibility
-  Better  
connectivity



### EFOY Lithium Battery

-  BMS Battery Manage-  
ment System
-  Charging down  
to -20 °C
-  High discharge  
current / capacity

### EFOY Hybrid Power

-  Powerful
-  Intelligent
-  Efficient



# Innovations from the 5th generation of the EFOY Pro Fuel Cell



## Extended lifetime warranty

Guaranteed lifetime of 6.000 operation hours for EFOY Pro fuel cells  
33% more guaranteed lifetime compared to series EFOY Pro 2.1 (4.500 h)

## Higher power and more flexibility

Different EFOY models to choose  
Up to 125 W output power

## Improved installation options

Lower height of the EFOY fuel cell  
Longer fuel connection  
Less weight

## EFOY Cloud\* capable

IoT-Internet capable, automatic firmware updates, remote maintenance

\*requires additional hardware

# EFOY Fuel cells Product Overview

## Product Overview



EFOY 80

EFOY 150

EFOY Pro 900

EFOY Pro 1800

EFOY Pro 2800

Max. Output Power	40 W	75 W	42 W	82 W	125 W
Output Power after 3.000 hours	24 W	45 W	34 W	68 W	105 W
Output Power after 6.000 hours	--	--	28 W	56 W	87 W
Guaranteed lifetime	3000 h	3000 h	6000 h	6000 h	6000 h
Cumulated power output over guaranteed lifetime	~ 96 kWh	~ 180 kWh	~ 210 kWh	~ 414 kWh	~ 636 kWh

# New EFOY and EFOY Pro Fuel Cells

## Comparison EFOY 150 and EFOY Pro 1800



EFOY 150 OP FM2



EFOY Pro 1800 OP FM2

Max. Output Power	75 W	82 W
Guaranteed lifetime	3000 h	6000 h
Cumulated power output over guaranteed lifetime	~ 180 kWh	~ 414 kWh
Prices	4,165.50 €	4,950.00 €
Price / kWh	23.14 €	11.96 €

Price advantage for EFOY Pro 1800 on TCO calculation compared to EFOY 150

# Better installation options

## Connection of EFOY Pro, Fuel Manager and Cartridge



VS.

More installation flexibility due to extended fuel connectors.



# Innovations

## EFOY Fuel Manager FM2, FM4, FM8



### Higher autonomy

With the new Fuel Manager FM2, FM4, FM8 you can connect 2, 4 or 8 fuel cartridges and extend your autonomy.

### More flexibility, Long fuel connections

Every fuel connector has a length of 125 cm. Extension of your installation flexibility.

### EFOY Cloud\* capable

IoT-Internet capable, automatic firmware updates, remote maintenance

\* in combination with EFOY fuel cell

# Innovations

## EFOY Fuel Manager



FM2



FM4



FM8\*

Article	EFOY Fuel Manager FM2	EFOY Fuel Manager FM4	EFOY Fuel Manager FM8*
Connectable fuel cartridges	2	4	8
Dimensions (L x W x H)	150 x 73 x 170 mm	150 x 127 x 170 mm	150 x 235 x 170 mm
Weight	0,97 kg	1,73 kg	3,24 kg
Length of fuel connectors	1,25 m	1,25 m	1,25 m

\*FM8 start of delivery Q2/2021

# Innovations

## EFOY Lithium Battery



**EFOY Cloud\* capable**

IoT-Internet capable, automatic  
firmware updates, remote  
maintenance

\* in combination with EFOY fuel cell

### Battery Management System (BMS)

Parameter of the battery are controlled and optimized fully automatically  
Protection against over-discharge and deep discharge

### Charging down to -20 °C

With the integrated heating element, battery can be charged even at temperatures as low as -20 °C.

### High discharge current / capacity

for high discharge currents and enables an inverter of up to 2,500 W to be connected

# EFOY Lithium Battery

## Overview



**EFOY Li 70**



**EFOY 105**

Nominal capacity	70 Ah	105 Ah
Nominal voltage	12.8 V	12.8 V
Weight	11.8 kg	16.3 kg
Dimensions L x W x H	269 x 190 x 175 mm	368 x 190 x 175 mm
Article	EFOY Li 70 – 12 V	EFOY Li 105 – 12 V



# EFOY Fuel Cartridges

## High energy density and level of safety

- ⏻ High energy density of fuel cartridges with 1.1 kWh/liter
- ⏻ 1 kWh= 0.9 liter
- ⏻ Child safety lock and safety valve
- ⏻ Certified according to UN3473 for road, sea and air freight



# EFOY Pro Fuel Cells

## Comparison to previous EFOY Pro generation



EFOY Pro 2400 Duo



EFOY Pro 2800 OP FM2

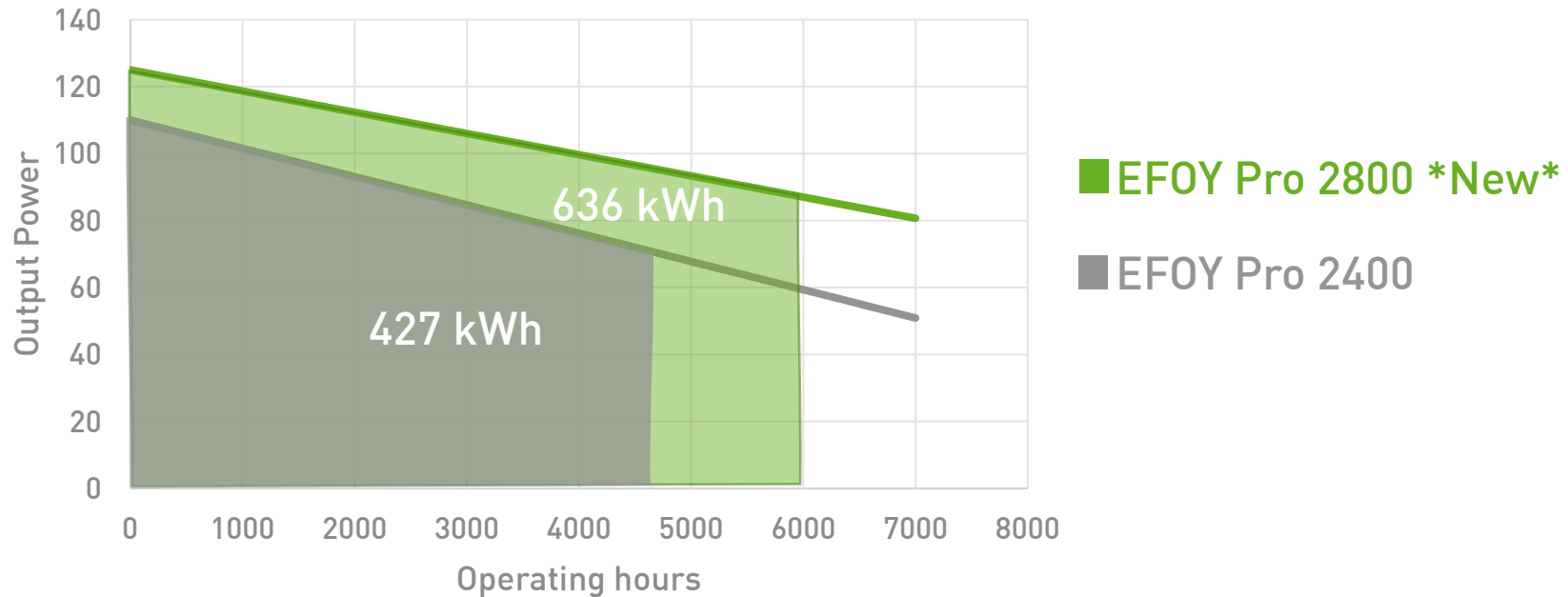
Max. Output Power	110 W	125 W
Guaranteed lifetime	4,500 h	6,000 h
Cumulated power output over guaranteed lifetime	~ 427 kWh	~ 636 kWh
Prices	6,350.00 €	6,250.00 €
Price / kWh	14.87 €	9.83 €

Price advantage due to increased power output and guaranteed lifetime.  
Significant reduction of costs per kWh.



# Comparison Output Power

## EFOY Pro 2400 and EFOY Pro 2800



**+ 50 %** increase in cumulated output power

# Performance scale

## EFOY fuel cells



40-75 W

40-125 W

0.5-1.5 kW

1.5-20 kW

Temporary  
operation

Continuous  
operation

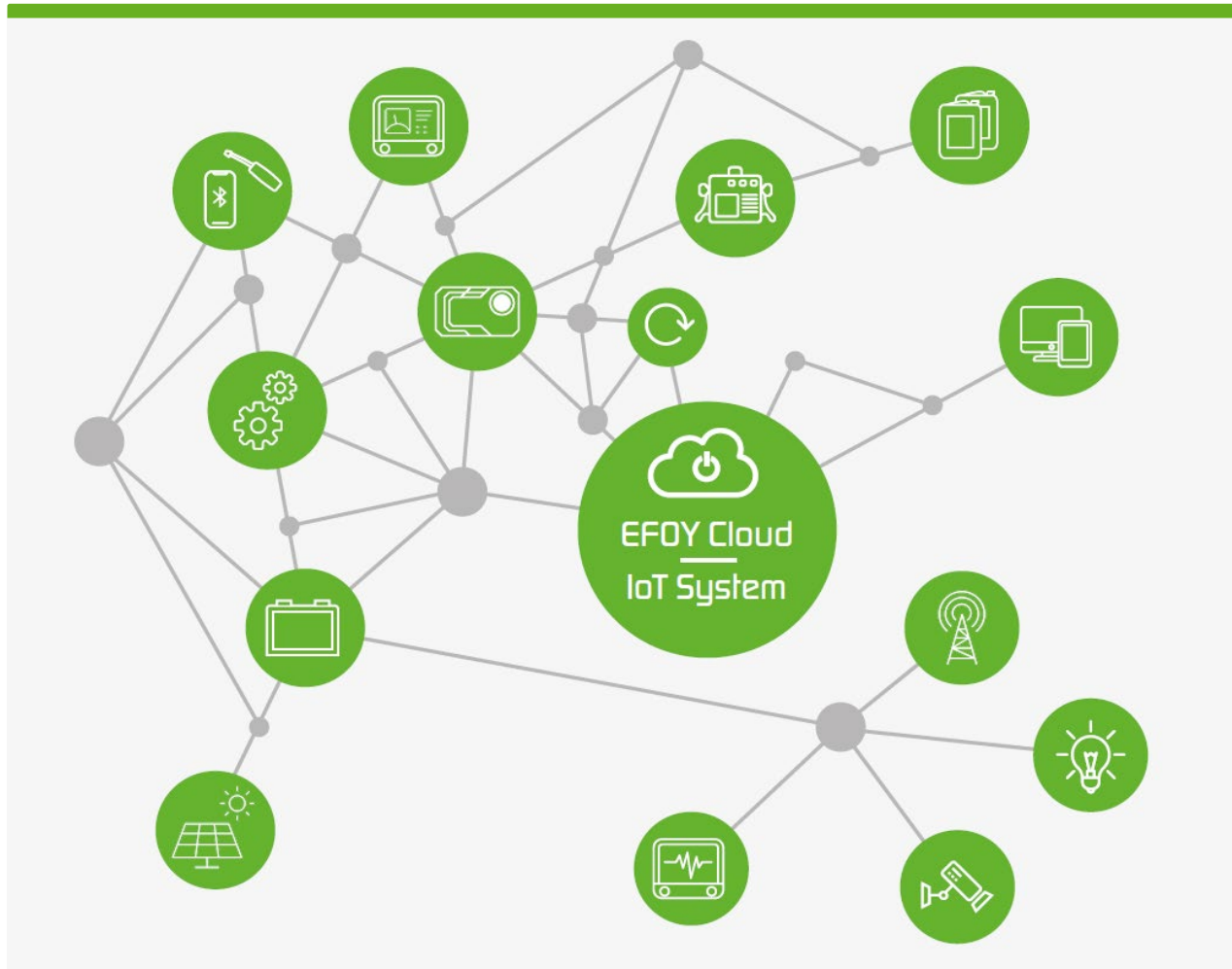
For higher output

EFOY fuel cells for every power requirement.



# EFOY fuel cell

## Connecting components



# EFOY Cloud – IoT System

## Benefits



### Remote Monitoring and Maintenance

With the EFOY Cloud you can track your EFOY and analyse historic data. Set warning and alarm alerts for individual conditions or adapt EFOY and battery settings without being at the operating site.

### Hardware independent

The fuel cell can be connected to many different router / modem. There is no specific hardware required.

### Keep the overview of all EFOY applications

Check the current firmware version, operating hours and fuel level in a clear list view. The current firmware update will be downloaded automatically.

# EFOY Cloud

## Remote Monitoring



### EFOY 1800 - Demo - 00071

EFOY Pro 1800 Service Level 0  
Serial Number: 430400-2011-00071

■ Status: **Standby**

Last updated: **14 seconds ago**

SET ALERTS

SERVICE LEVEL

REMOVE DEVICE

#### Fuel Cell

Operating Mode  
AUTO

Power Output  
0 W

Voltage at the battery  
12.77 V

Voltage at the EFOY  
12.19 V

#### Battery

Battery Type  
LiFePO4 12V



Charging cycles  
Automatic

*No value defined. /*

*No value defined.*

h

Manual

*No value defined. /*

*No value defined.*

h

#### Fuel Cartridges

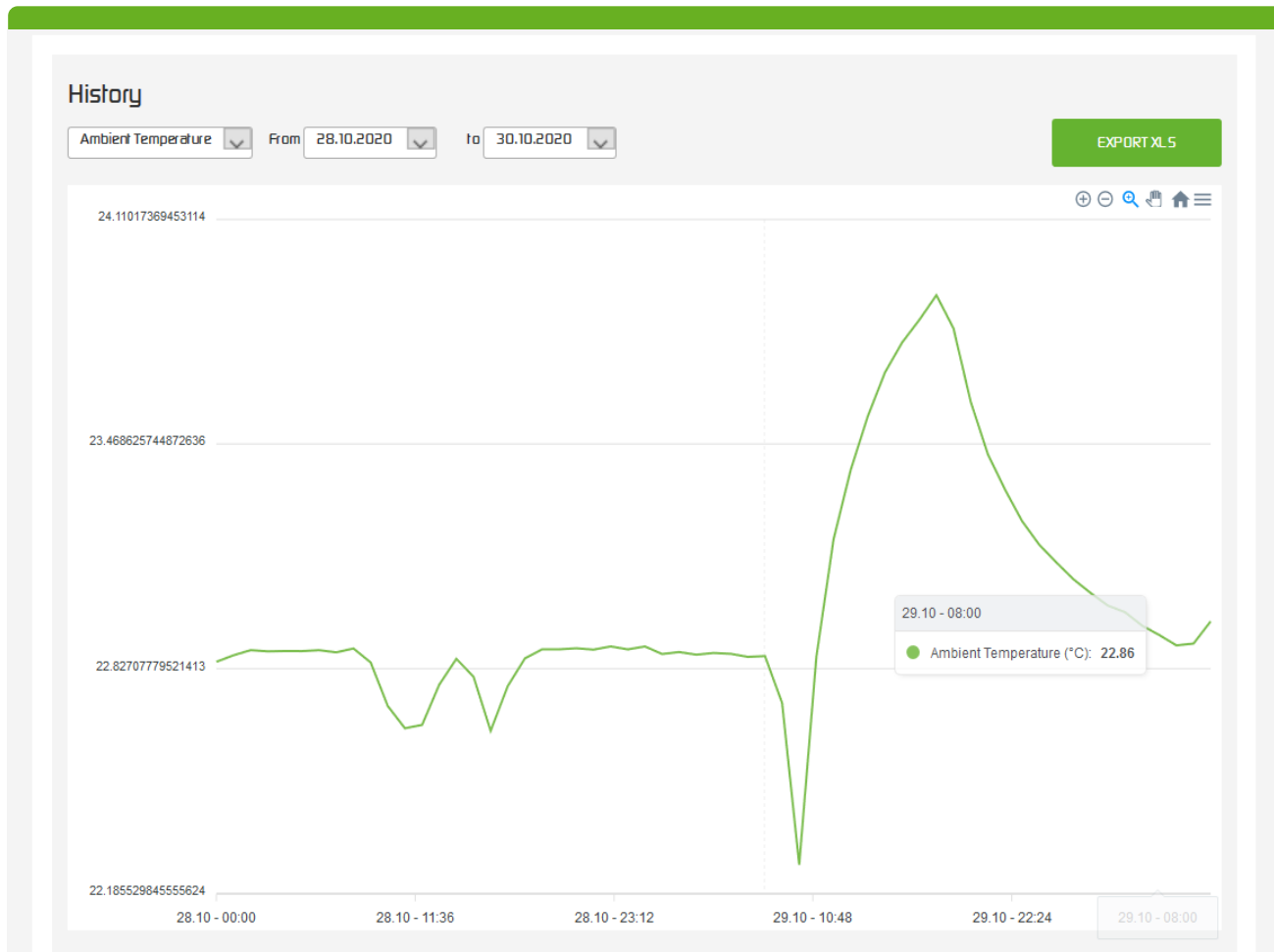


1. M10 (10L)  
replaced 30.10 - 10:34

Fuel Level  
100% (10.00l)

# EFOY Cloud

## Remote Monitoring



# EFOY Pro Energy Solutions for every requirement



**EFOY ProCabinet**  
Stationary energy solution



**EFOY ProCube**  
Mobile energy solution



**EFOY ProTrailer**  
Trailer-based energy solution



**EFOY ProEnergyCase**  
Mobile energy solution



**Custom solutions**  
Perfect solution for your requirements





Which fuel cell energy solutions suits which application?

# The perfect energy solution for data collection & transmission

## Reliable data transmission

Ø power demand: 23 W  
Autonomy: 40 days



EFOY Pro 900  
EFOY ProCube 2030



## Measuring stations

Ø power demand: 30 W  
Solar: 2x 100 Wp  
Autonomy: 30 days



© AAD Applied Acoustic Design

EFOY Pro 1800  
EFOY ProEnergyCase





# The perfect energy solution for video surveillance

## Stationary video surveillance

∅ power demand: 60 W  
 Solar: 250 Wp  
 Autonomy: 16 days



EFOY Pro 1800



## Mobile video surveillance

∅ power demand: 70 W  
 Autonomy: 60 days



EFOY Pro 2800  
 EFOY ProEnergyCase



# The perfect energy solution for traffic technology

## Power for traffic monitoring

∅ power demand: 30 W  
Autonomy: 30 days



EFOY 900  
EFOY ProCabinet 2020S



## Power for speed cameras

∅ power demand: 90 W  
Autonomy: 60 days



EFOY Pro 2800  
EFOY Pro Cabinet 2130A



# The perfect energy solution for on-board power

## On-board power for vehicles

∅ power demand: temp. 70 W  
Autonomy: 30 days



EFOY 150  
EFOY Pro 1800

EFOY Lithium Battery



## On-board power for fire brigade

∅ power demand: 70 W  
Autonomy: 30 days



EFOY Pro 2800  
EFOY Lithium Battery





# The perfect energy solution for wind applications

## Wind measurement with buoys

Ø power demand: 100 W  
 Solar: 4x 50 Wp  
 Autonomy: 5 months



© SEAWATCH

4x EFOY Pro  
 2800



## Wind measurement with wind trailer

Ø power demand: 80 W  
 Solar: 3x 250 Wp  
 Autonomy: 4 months



GWJ Umwelttechnik

EFOY Pro 2800



# The perfect energy solution for early detection of natural catastrophes

## Volcano measurement

Ø power demand:	50 W
Solar:	1200 Wp
Autonomy:	6 months



EFOY 150  
EFOY ProCube 2060A



# The perfect energy solution for oil & gas / mining

## Oil & Gas Applications

∅ power demand: 100 W  
Solar: 4x 410 Wp  
Autonomy: 16 months



EFOY Pro 2800  
EFOY ProCabinet 4060SX



## Mining Applications

∅ power demand: 90 W  
Solar: 4x 410 Wp  
Autonomy: 60 days



EFOY Pro 2800  
EFOY ProTrailer



# EFOY Fuel cells

## Prices Europe



EFOY 80

EFOY 150

EFOY Pro 900

EFOY Pro 1800

EFOY Pro 2800

Operating  
Panel (OP)

2,205.00 €

3,465.50 €

2,750.00 €

4,250.00 €

5,550.00 €

OP + FM2

2,905.00 €

4,165.50 €

3,450.00 €

4,950.00 €

6,250.00 €

OP + FM4

3,305.00 €

4,565.50 €

3,850.00 €

5,350.00 €

6,650.00 €



# EFOY Battery & Fuel Manager

## Prices Europe



EFOY Li 70  
12 V

1,259.66 €



EFOY Li 105  
12 V

1,638.65 €



FM2

700.00 €



FM4

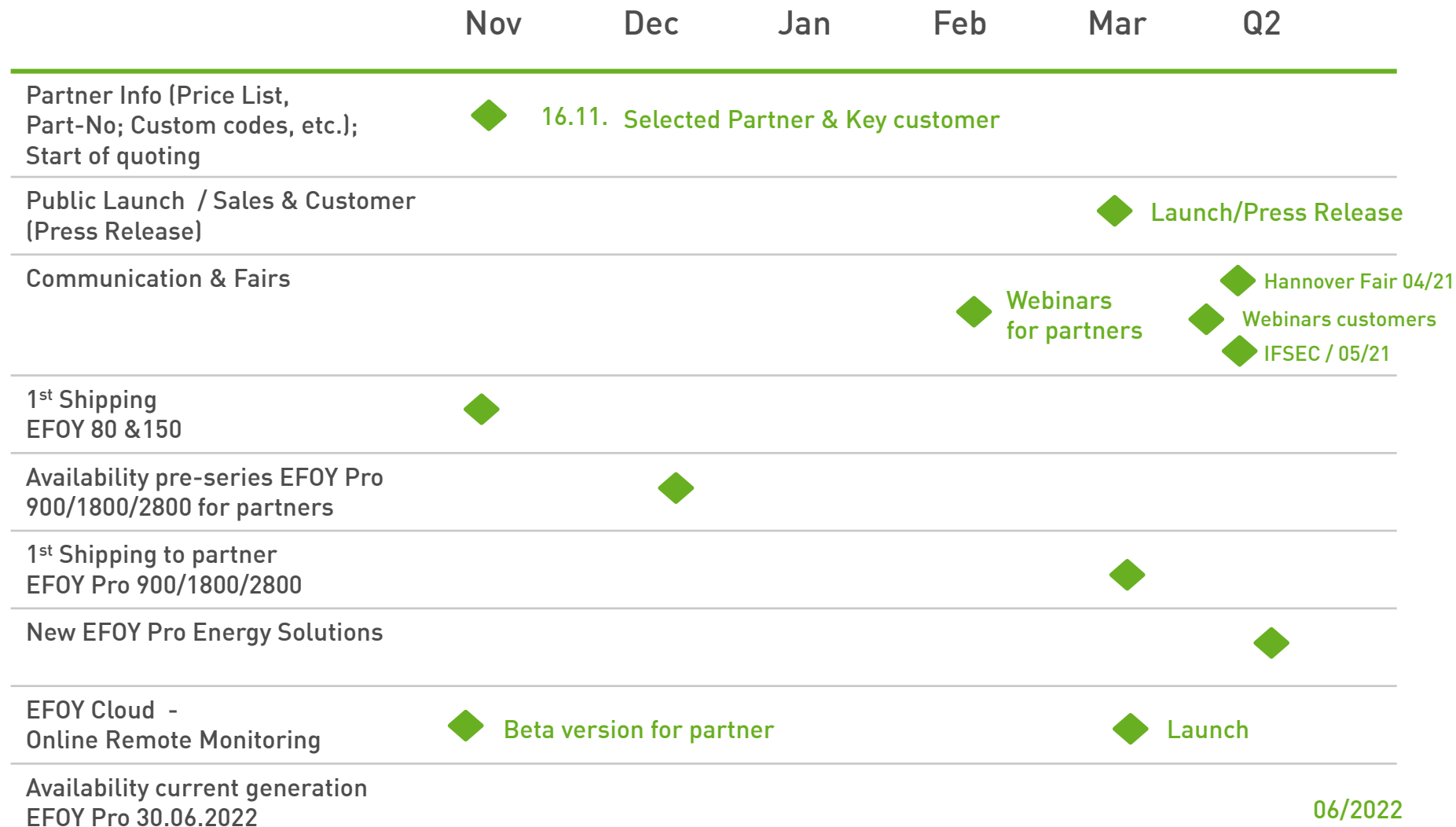
1,100.00 €



FM8

1,800.00 €

# Timeline Market Entry for professional users



# EFOY Hybrid Power Advantages





SFC Energy AG  
Sales  
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