



EFOY Fuel Cell Solutions from SFC Energy

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You can find more information on our website at efoy-pro.com

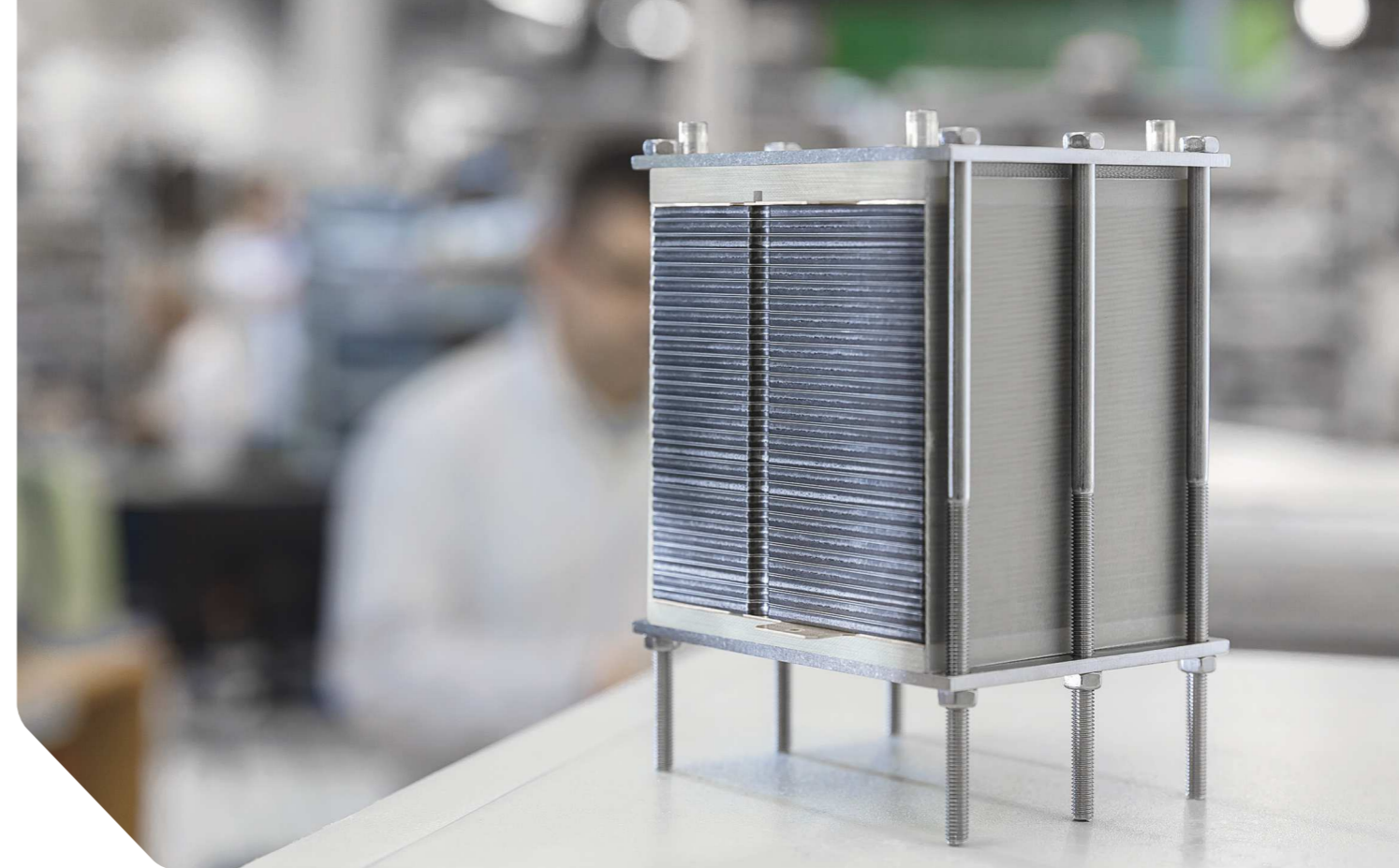
SFC Fuel Cell technologies



Extraordinarily environmentally friendly

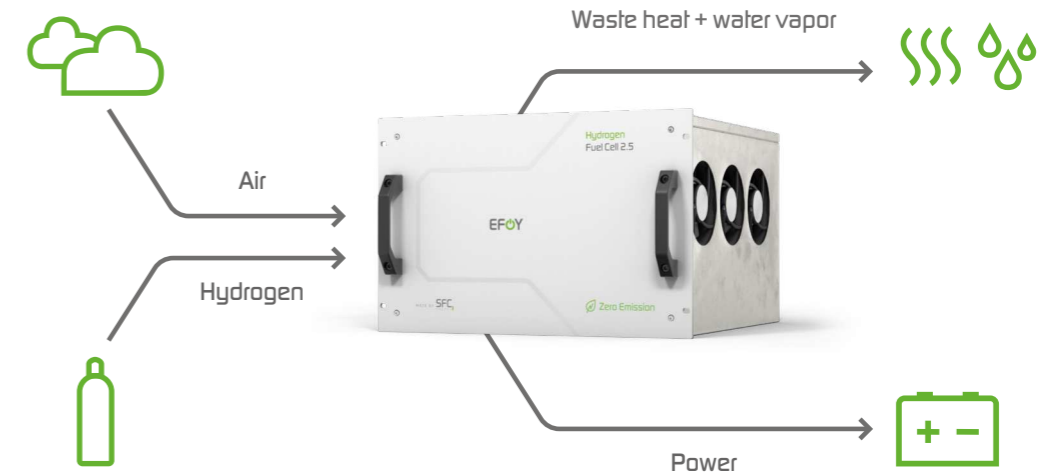
SFC's EFOY Fuel Cells are based on two fuel cell technologies, DMFC (direct methanol fuel cell) and PEM (polymer electrolyte membrane). Our EFOY and EFOY Pro Fuel Cells are based on DMFC technology and our EFOY Hydrogen Fuel Cells are based on PEM technology. At the heart of any fuel cell is the stack that is the power generating core component of the fuel cell. By feeding hydrogen and oxygen to the stack, electricity is generated through an electrochemical process called cold-combustion. As part of the process, only waste heat, water vapour and, with our DMFC fuel cells, a small amount of carbon dioxide, are generated. In the case of our EFOY and EFOY Pro Fuel Cells, methanol is fed to the fuel cell stack where hydrogen is extracted

from the methanol as part of the electrochemical reaction (direct methanol fuel cell technology). Pure methanol is supplied in SFC's patented fuel cartridges specifically design for use with our EFOY and EFOY Pro Fuel Cells. Commercially available hydrogen cylinders are used to supply our EFOY Hydrogen Fuel Cells with pure hydrogen. EFOY Fuel Cells work completely automatically, quietly and are environmentally friendly. They can be installed in concealed and tamper-proof cabinets and will reliably produce electricity independently of the weather. This is an exceptionally environmentally friendly way to produce energy.



Direct methanol technology

EFOY Direct Methanol Fuel Cells charge batteries completely automatically. The integrated charge controller permanently monitors the charge status of the battery. When required, the EFOY Fuel Cell is started automatically and turned off again when the battery has been charged. In this way, batteries last significantly longer, since the controlled charging protects them from harmful deep discharges. This means long self sufficiency without user intervention for your application.

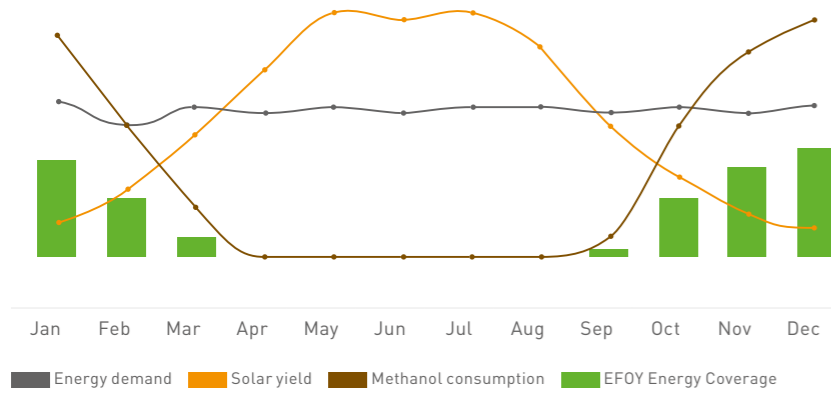


Hydrogen technology

The EFOY Hydrogen Fuel Cell serves as a back-up power supply solution and as an emergency power supply system ensures the uninterrupted power supply for your application in case the power fails. The hydrogen fuel cell starts to operate as soon as the battery voltage falls below a threshold value and takes over the power supply to your application.

Longer system autonomy due to hybrid operation

Hybrid operation with solar-powered systems



The combination of solar power and fuel cells is ideal for applications requiring energy all year round regardless of the weather.

EFOY Fuel Cells are ideal for hybrid operation with solar-powered systems. The EFOY then only switches on if the solar module can no longer provide enough electricity due to poor weather. By using a hybrid power supply with EFOY Fuel Cells and solar-powered modules, the autonomy of the system is extended many times over without user intervention.

Which EFOY is the right one?

Thanks to the EFOY Energy Calculator, you can precisely calculate your energy demand. You receive a recommendation of which EFOY Fuel Cell will be the appropriate one for you. As an additional option, you can also take into consideration the potential energy available from solar panels.

Enter your power demand

Power demand (W)

Operating time

Peak performance

Peak load duration

Output voltage

Input voltage

Fuel supply for test runs

The right fuel cell for your application

EFOY Pro Methanol



40 W – 125 W
clustered up to 500 W

EFOY Pro 12000 Duo Methanol



500 W
clustered up to 3 kW

EFOY Hydrogen Hydrogen



2.5 kW
clustered up to 50 kW

EFOY H₂PowerPack X50 Hydrogen



50 kW
clustered up to 200 kW

efoy-pro.com/energy-calculator

EFOY Fuel Cells for professional users

Clean energy everywhere

EFOY Fuel Cells are the ideal power generators for a wide range of stationary and mobile applications. They generate electricity reliably for weeks and months without user intervention. The EFOY Direct Methanol Fuel Cells are available as EFOY and EFOY Pro models with an output of up to 500 W depending on the power requirements and user requirements. Our EFOY and EFOY Pro models are designed for different application purposes. The EFOY models are designed for temporary applications with low operating hours and are used as a back-up power supply

for grid-connected or solar-powered hybrid installations. The EFOY Pro series is ideal for continuous operation and can also be used in hybrid operation. You can operate your application completely autonomously with the EFOY Pro, compensate for low solar output and use smaller solar modules. The EFOY Hydrogen Fuel Cell serves as a back-up power supply solution and ensures the power supply in case the power fails.

EFOY 80



EFOY 150



EFOY Pro 900



| | | | |
|---|--|-------------------|--|
| Max. output ¹ | 40 W | 75 W | 42 W |
| Nominal voltage | 12/24 V DC | | 12/24 V DC |
| Weight | 6.5 kg / 14.3 lbs | 6.9 kg / 15.2 lbs | 6.5 kg / 14.3 lbs |
| Dimensions (L x W x H) | 448 x 198 x 275 mm / 17.6 x 7.8 x 10.8 in | | 448 x 198 x 275 mm / 17.6 x 7.8 x 10.8 in |
| Connectable fuel cartridges / gas cylinders | 1 (up to 8 with EFOY Fuel Manager) | | 1 (up to 8 with EFOY Fuel Manager) |
| Operating temperature | -20 °C to +40 °C / -4 °F to +104 °F | | -20 °C to +50 °C / -4 °F to +122 °F |
| Operating materials | Methanol in EFOY Fuel Cartridges | | Methanol in EFOY Fuel Cartridges |

Performance classes of the EFOY Fuel Cells

Temporary applications

Continuous operation

Advantages

- 100% reliable
- Autonomous, low maintenance
- Environmentally friendly and quiet
- Lightweight and compact
- Remote surveillance
- Reduced operating costs

Which EFOY is the right one for me?

Use our energy calculator to determine the model that suits your needs.

efoy-pro.com/energy-calculator

You can find extensive technical details at efoy-pro.com

EFOY Pro 1800



EFOY Pro 2800



EFOY Pro 12000 Duo



EFOY Hydrogen 2.5



| | | | |
|--|-------------------|--|---|
| 82 W | 125 W | 500 W | 2500 W |
| 12/24 V DC | | 24/48 V DC | 48 V DC |
| 7.2 kg / 15.9 lb | 7.8 kg / 17.2 lbs | 32 kg / 70.5 lbs | 28.5 kg / 62.8 lbs |
| 448 x 198 x 275 mm / 17.6 x 7.8 x 10.8 in | | 640 x 441 x 310 mm / 25.2 x 17.4 x 12.2 in ² | 493 x 483 x 310 mm / 19.4 x 19 x 12.2 in ² |
| 1 (up to 8 with EFOY Fuel Manager) | | 2 (up to 4 with DCS1) | The system has two connections. Several H ₂ gas cylinders can be connected to each other. ³ |
| -20 °C to +50 °C / -4 °F to +122 °F | | -20 °C to +50 °C / -4 °F to +122 °F | -33°C to +50°C / -27.4 °F to 122 °F ³ |
| Methanol in EFOY Fuel Cartridges | | Methanol in EFOY Fuel Cartridges | Hydrogen |

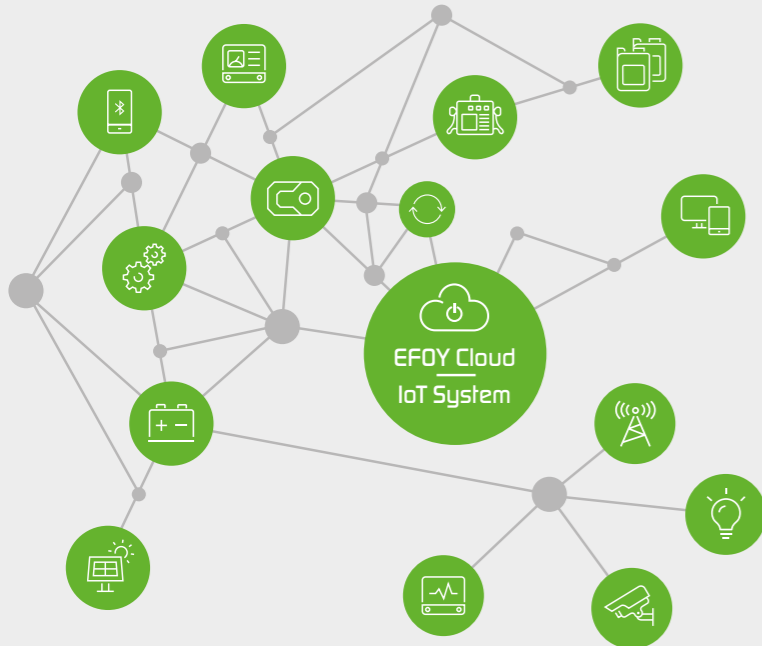
Continuous operation

For higher power

¹ With increasing operating hours and temperatures > 30 °C, the output power gradually decreases.

² Dimensions without 19" frame. ³ In an appropriate energy solution. All technical data under test conditions of 20°C.

Accessories and control tools



Utilise the various control options for EFOY Fuel Cells.

Operate the EFOY on site via a control panel or remotely from your laptop, smartphone or tablet. The EFOY accessories allow you to monitor your fuel cells around the clock, to incorporate them into an existing communication network and extend the self sufficiency of your systems.

Remote monitoring with EFOY Cloud

EFOY Fuel Cells are often used in remote locations and require the option of secure remote access. The EFOY Cloud gives you access to your methanol fuel cells from anywhere so you can monitor continuous operation via laptop, tablet or smartphone. All you need for this is an Internet connection to your fuel cells.

You can, for example, track the current operating status of each of your fuel cells, historical data or fill levels of the EFOY Fuel Cartridges. If necessary, configure battery parameters and receive the firmware updates completely automatically. The integrated alarm management informs you, for example, by email of upcoming fuel cartridge replacements or a battery voltage that falls below the threshold.



Extended data acquisition with EFOY MultiSense

The EFOY MultiSense enables extended data acquisition of the entire energy solution. It provides continuous data on additional charging currents, such as those from solar cells, or electrical load. Furthermore, temperatures of the installation situation and the battery can be recorded. All sensor data can be viewed via the EFOY Cloud and the OP3 control panel. The EFOY MultiSense is easy to operate and install and is integrated into the SFC bus communication. Available as EFOY MS4 and MS8, the EFOY MultiSense provides two connections for analog sensors and two connections for temperature sensors. The MS8 also offers four digital inputs/outputs (I/O).

Control and configuration via control panel or the EFOY App

The control panel in the EFOY makes it possible to easily operate the EFOY and the EFOY Pro Fuel Cell. With just a few clicks, you can view information about the current operation of the fuel cell, such as the average charge duration, the battery voltage, the current charging current as well as the fuel cartridge fill level. Battery parameters can always be adapted to special requirements. You can also access this data via Bluetooth or your EFOY App. All you need is the EFOY Bluetooth Adapter.



Extend the self sufficiency with the EFOY Fuel Cartridges Manager

The Fuel Manager (FM) allows you to operate several EFOY Fuel Cartridges with one EFOY. Depending on the model, two, four or eight fuel cartridges can be simultaneously connected. The Fuel Manager automatically switches from the empty one to the next full fuel cartridge and ensures a long self sufficiency without user intervention.

Example of an application with continuous 50 W (without solar energy support)

| Fuel cell + FM | Fuel cartridges | Self sufficiency |
|---------------------|-----------------|------------------|
| EFOY Pro 1800 | 1x M28 | 26 days |
| EFOY Pro 1800 + FM2 | 2x M28 | 52 days |
| EFOY Pro 1800 + FM4 | 4x M28 | 104 days |
| EFOY Pro 1800 + FM8 | 8x M28 | 208 days |



EFOY Fuel Manager (FM)

The EFOY Fuel Manager makes it possible to operate 2, 4 or 8 fuel cartridges. Not compatible with EFOY Pro 12000 Duo.



Fuel cartridge sensor

The fuel cartridge sensor is used to measure the methanol level in the fuel cartridge. It will indicate when the fuel cartridges need to be changed.



EFOY Bluetooth Adapter

The EFOY Bluetooth Adapter makes it possible to control the fuel cells via the EFOY App. Not compatible with the EFOY Pro 12000 Duo.

Please note that not all accessory parts are compatible with all fuel cells. If you have any questions, feel free to contact us.

¹ Example

You can find more information on our website at efoy-pro.com/efoy-cloud

EFOY Lithium Batteries

The EFOY Lithium Battery is the ideal way to start using an off-grid power supply. The smart Battery Management System (BMS) continuously controls the battery parameters in order to optimise the battery's efficiency and to protect it. Thanks to the built-in heating element, the EFOY Lithium Battery can be charged even at temperatures below zero.

The ideal job for the EFOY Lithium Battery



Advantages

- High discharge current
- Suitable for the winter
- Battery Management System

The smart Battery Management System

The smart EFOY BMS ensures that the parameters of the EFOY Lithium Battery are controlled and optimised fully automatically. In this way, the battery is ideally protected from overcharging and deep discharge.

The ideal battery for cold temperatures

The EFOY Lithium Battery works even at low temperatures. Commercially available lithium batteries cannot be charged in cold temperatures. Thanks to the built-in heating element, it can also be charged even in temperatures down to -20°C.

Splash-proof

The EFOY Lithium Battery is protected against splash water, making it ideal for extreme ambient requirements.

Ideal for high peak loads

Heavy consumers often stress a battery with high peak currents. The EFOY Lithium Battery is ideally designed for such consumers.

Safe LiFePO₄ technology

We rely on the proven and safe lithium iron phosphate technology (LiFePO₄).

High energy capacity with a low weight

Compared to conventional lead batteries, the EFOY Lithium Battery has a high energy capacity with a low weight. In addition, it can be 100% discharged.

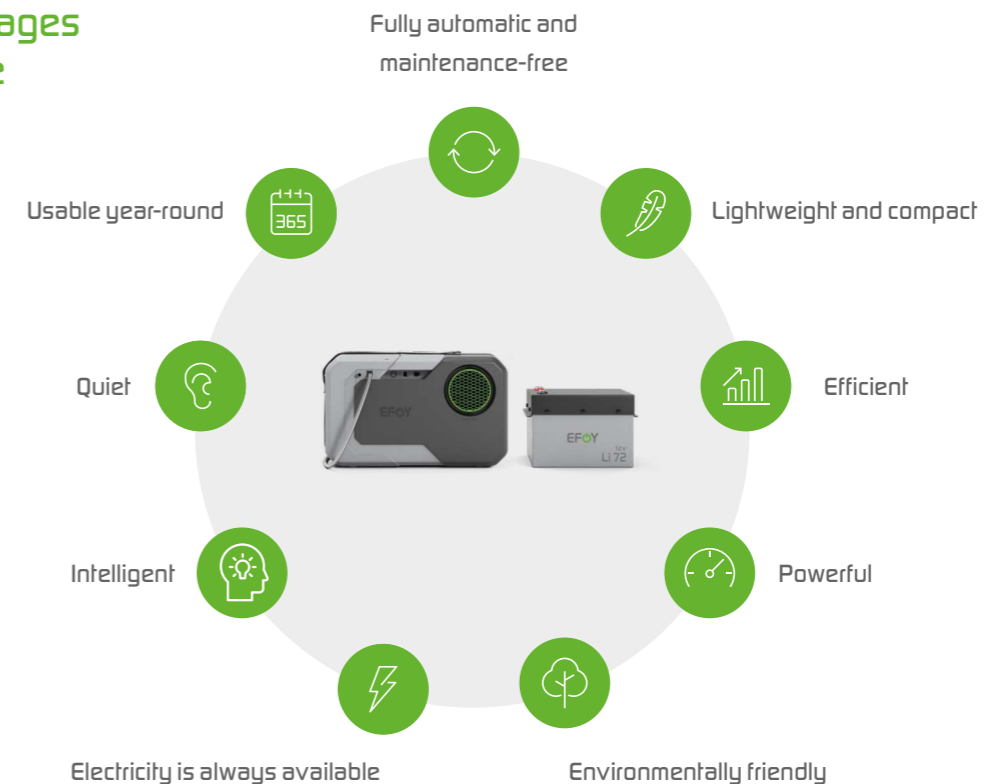
| Battery | EFOY Li 70 | EFOY Li 105 |
|---------------------------------------|---|---|
| Technology | Lithium iron phosphate | |
| Nominal voltage in V | 12.8 V | |
| Capacity in Ah | 70 Ah | 105 Ah |
| Comparable capacity of a lead battery | 140 Ah | 210 Ah |
| Max. discharge current/contr. | 230 A / 70 A | 300 A / 105 A |
| BMS | Integrated | |
| Protection class | IP 44 | |
| Operating temperature | -20°C to 60°C / charging up to 45°C | |
| Connection | M8 / vehicle crocodile clip | |
| Dimensions (L x W x H) | 268 x 175 x 190 mm / 10.6 x 6.9 x 7.5 in | 368 x 175 x 190 mm / 14.5 x 6.9 x 7.5 in |
| Weight | 11.8 kg | 16.3 kg |
| Interfaces | 2x RJ 12: SFC bus and EFOY Bluetooth Adapter BT2 | |

EFOY Hybrid Power Fuel Cell and Lithium Battery

EFOY Hybrid Power is a perfectly matched energy package consisting of EFOY Fuel Cells as power generators and EFOY Lithium Batteries as power storage. 100% autonomous, environmentally friendly and quiet. The smart BMS of the EFOY Lithium Battery ensures intelligent communication between the fuel cell and battery. This way, the EFOY Fuel Cell works at maximum efficiency and the battery benefits from ideal charging, special protection and a long service life. And you benefit from a particularly powerful and efficient energy supply – simply intelligent.



All advantages at a glance



Extensive technical details can be found on our website at efoy-pro.com

EFOY Pro Energy Solutions

As a system solutions provider, SFC Energy is constantly working to develop complete solutions for various requirements. EFOY Pro Energy Solutions combine power generation via EFOY Pro Fuel Cells and energy storage with batteries in a suitable housing. There is still sufficient space for customer-specific adaptations.

Stationary energy solutions



EFOY ProCabinet

EFOY ProCabinets are a complete energy solution for outdoors for an autonomous, stationary power supply with EFOY Pro Fuel Cells – entirely without a mains connection. The complete, stationary energy solution consists of a control cabinet, which offers room for an EFOY Pro, batteries, solar charging control, as well as one or more fuel cartridges depending on the application. Different types of charge controllers, a modem for remote monitoring or a voltage converter can optionally be installed. EFOY ProCabinets are ideal, for example, for stand-alone operation or as a back-up solution for an uninterruptible power supply (UPS).

You can find an overview of all EFOY ProCabinet models on our website at efoy-pro.com/cabinet-en

Stationary energy solutions



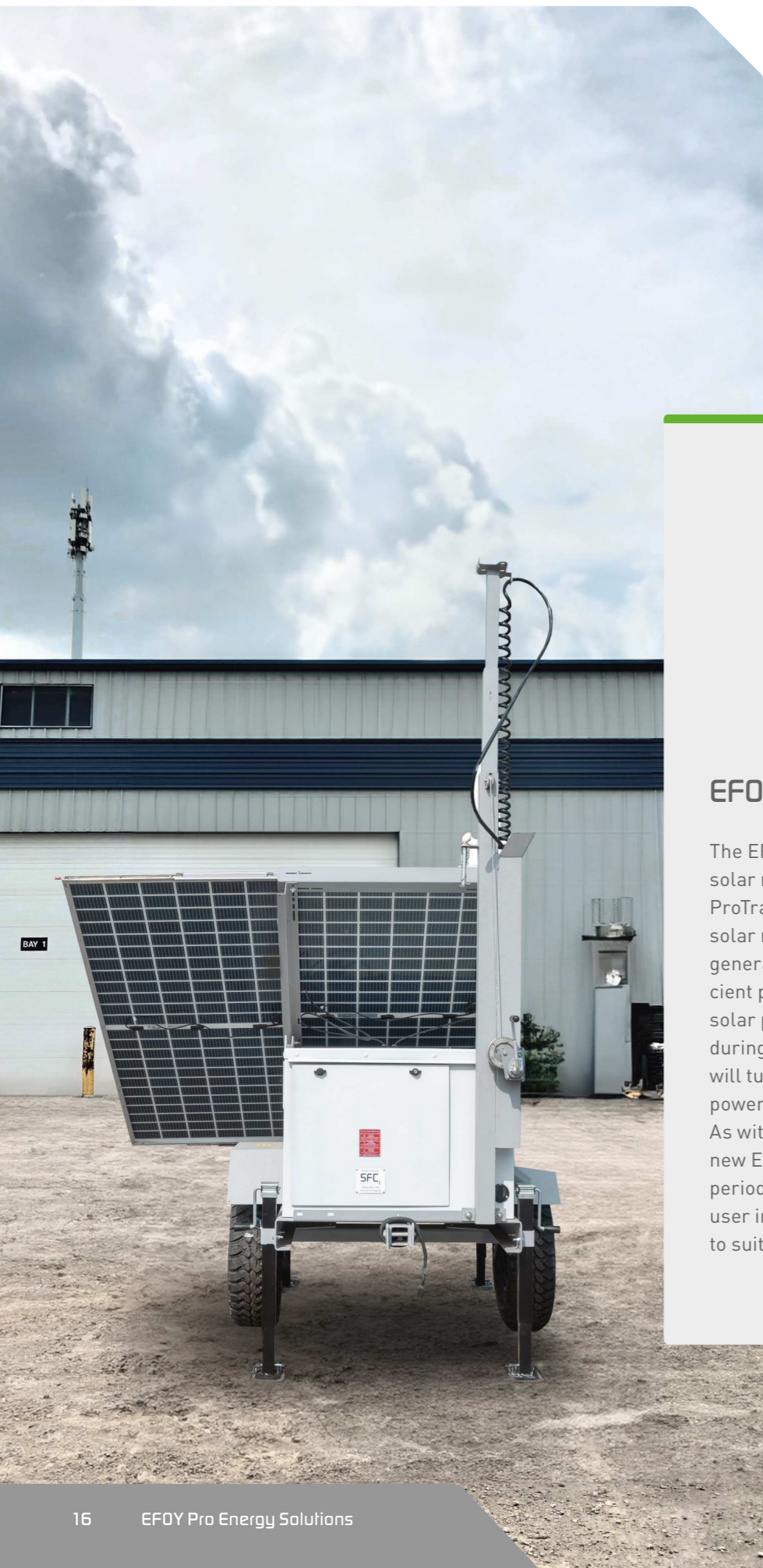
EFOY ProShelter

The EFOY ProShelter hybrid systems are designed for an autonomy of approx. 12-18 months and are therefore ideal for long-term autonomous use. The robust, specially developed EFOY ProShelter contains EFOY Pro Fuel Cells in a 15 cm thick insulated container including fuel cartridges, battery storage, solar charge controller, power distribution panel and sufficient space for the integration of customer equipment in the interior. Performance is guaranteed even at temperatures as low as -40°C .

Customized energy solutions

Every project has specific requirements and we offer you the perfectly tailored energy solution. Depending on your needs, we carry out individual adaptations or develop a customized solution based on your requirements.





Mobile energy solution



EFOY ProTrailer

The EFOY Pro Fuel Cell, with up to four solar modules, is integrated in the EFOY ProTrailer. The hybridisation of fuel cell and solar modules combines these two power generators in a cost-effective way. If sufficient power is no longer generated via the solar panel, for example, in bad weather, during winter or in the shade, the fuel cell will turn on automatically to take over the power supply. This saves operating costs. As with all EFOY Pro Energy Solutions, the new EFOY ProTrailer offers extremely long periods of autonomy without any need for user intervention and it can be configured to suit the customer's requirements.



EFOY ProCube

The EFOY ProCube is a mobile, maintenance-free complete solution for off-grid power supplies – instantly ready for use at all times and in any location. The box is suitable for outdoor use and is pre-configured so it can be customised to your requirements by selecting the relevant size of EFOY Pro, fuel cartridge and battery. The EFOY ProCube is available in two designs with room for one or two M28 fuel cartridges. The EFOY ProCube can be used temporarily, e.g. on construction sites, or permanently in hard-to-access areas. This complete energy solution is perfect for applications outdoors.

Mobile energy solution

EFOY ProEnergyCase

The EFOY ProEnergyCase is a portable, maintenance-free, all-in-one solution for grid-independent power supplies. The robust housing and fast setup process means that the EFOY ProEnergyCase is ready for use at any time and in any location. One EFOY Pro Fuel Cell, up to two batteries and up to two M10 fuel cartridges can be integrated into the EFOY ProEnergyCase. The integrated solar charging control makes the EFOY ProEnergyCase ideal for hybrid operation with solar systems. Long-lasting, independent operation without user intervention is therefore guaranteed.

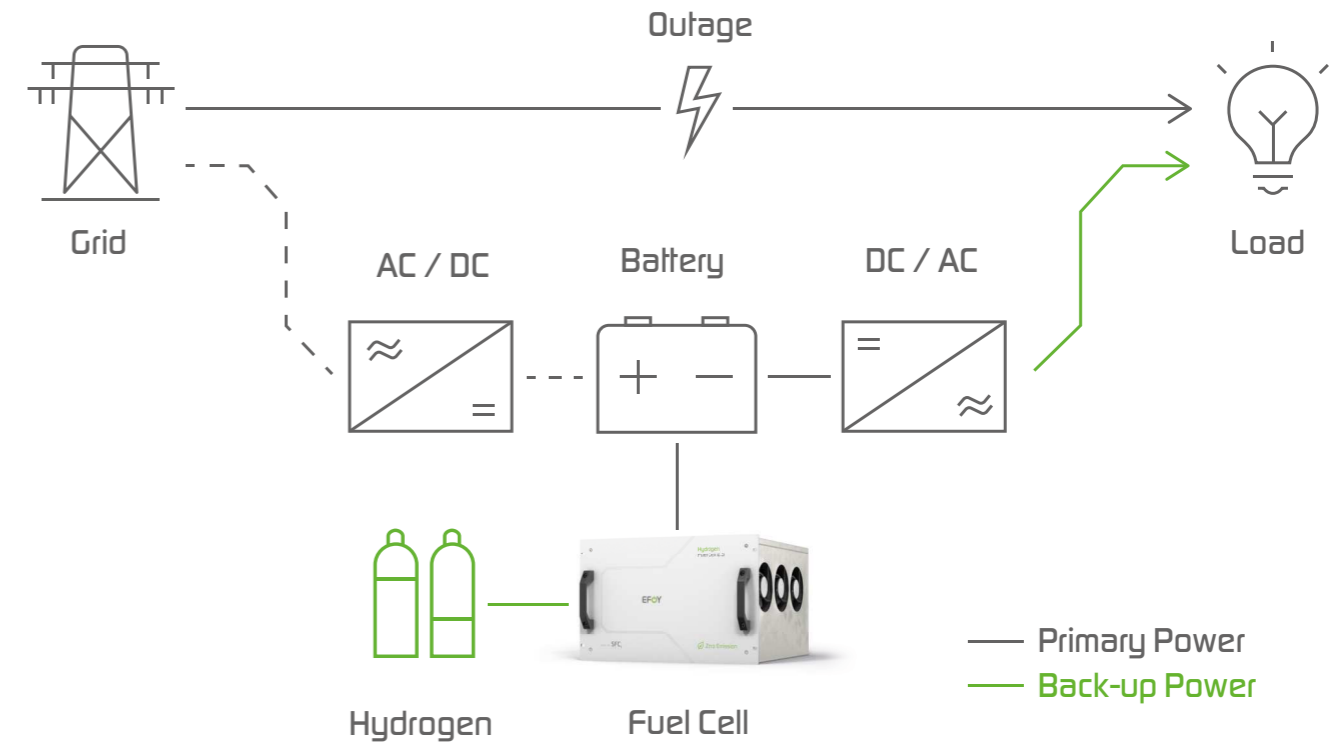


You can find an overview of all energy solutions on our website at efoy-pro.com/energy-solutions

EFOY Hydrogen Fuel Cells



 Zero Emission



The hydrogen fuel cell for higher power ranges

The hydrogen-powered EFOY Hydrogen Fuel Cell complements SFC Energy's comprehensive product portfolio with Energy Solutions in the higher power range. Power outputs from 2.5 to 50 kW can be scaled individually. The EFOY Hydrogen Fuel Cell is perfectly suited to replace conventional diesel generators. The EFOY Hydrogen Fuel Cell is emission-free, very quiet and an efficient hydrogen fuel cell solution. Therefore, the EFOY Hydrogen Fuel Cell can also be used in ecologically sensitive areas.

EFOY Hydrogen 2.5

| | |
|------------------------------------|------------------------------|
| Output power ¹ | 2,500 W |
| Nominal voltage | 48 V DC |
| Weight | 28.5 kg |
| Operating materials | Hydrogen 3.0 |
| Nominal consumption H ₂ | 0.06 kg H ₂ / kWh |
| Operating temperature ² | -33 °C bis +50 °C |
| Dimensions (LxWxH) | 493 x 483 x 310 mm |
| Operation | Remote Monitoring Tool |
| Data interface ² | Modbus |

¹ Only achievable at supply air temperatures of < 30°C and < 1,000 hours of operation

² In an appropriate energy solution

Emergency power supply for critical infrastructure

Major emergencies, environmental disasters, uncertainties in the energy grid – these are just a few of the reasons that can lead to a power supply failure. The uninterrupted operation of critical infrastructure is of particular importance in order to remain operational in the event of an emergency. Examples of critical infrastructure include security-relevant applications, such as digital radio for authorities and organisations with security tasks (emergency services), along with the mobile communications sector, energy, gas and water supply sectors. Current emergency power solutions are based almost exclusively on generators and conventional battery solutions with limited range. Long term, reliable operation over several days is difficult to achieve.

Materials, logistics, disposal costs and additional expenses for maintenance and fuel storage, are significantly reduced by using fuel cells. EFOY Hydrogen Fuel Cells are already in use at numerous locations for backup power supply. The fuel cell modules switch on fully automatically and take over the load after a power failure. Thanks to their low maintenance requirements and the fact that they ensure an uninterrupted takeover of the power supply, fuel cells are the ideal solution for running plants reliably, emission-free and self-sufficiently for several days. Unlike diesel generators, solutions using EFOY Hydrogen Fuel Cells do not produce any CO₂ or other emissions.

EFOY Hydrogen Energy Solutions for EFOY Hydrogen Fuel Cells

Cabinet solutions for EFOY Hydrogen Fuel Cells

EFOY H₂Cabinets are turnkey hydrogen power solutions with integrated EFOY Hydrogen Fuel Cells. The modular concept allows for a configuration that is customizable to your requirements. This could range from examples such as a stand-alone system, a backup power system or as an uninterruptible emergency power supply for a power range from 2.5 to 50 kW. The EFOY H₂Cabinets are available in either indoor or outdoor applications.



EFOY H₂Cabinet N-Series

The H₂Cabinet N-Series is designed for indoor installations and has a defined connection point for a hydrogen line. The hydrogen storage tank can be selected in terms of size and location providing flexibility for the installation.



EFOY H₂Cabinet X-Series

The H₂Cabinet X-Series is the turnkey system for outdoor use. Individual hydrogen cylinders or cylinder bundles provide for an easy and efficient replacement in the field for this energy solution.



Example of hydrogen supply and operating time

| | | |
|--------------------------|--------------------|---------------------|
| H ₂ cylinders | 6 x 50 l (300 bar) | 12 x 50 l (300 bar) |
| Operating time | 43.2 h @ 2.5 kW | 86.4 h @ 2.5 kW |
| Operating time | 21.6 h @ 5.0 kW | 43.2 h @ 5.0 kW |
| Nominal capacity | 108 kWh | 216 kWh |





H₂Genset

The mobile emission-free power generator with EFOY Hydrogen Fuel Cells

The EFOY H₂Genset is a flexible and mobile power generator using hydrogen for areas without access to the conventional power grid, such as construction sites, outdoor events, temporary power supply of telecommunication masts or as a mobile emergency power supply. Thanks to the modular design with integrated EFOY Hydrogen Fuel Cells, the performance range can be precisely tailored to suit your requirements. At the same time, the H₂Genset with proven fuel cell technology delivers clean and quiet energy with low maintenance effort and costs. Conveniently and easily monitor individual generators or entire fleets with the suitable IoT solution. The world's first mobile and emission-free generator using hydrogen in its power class with an integrated tank system was jointly developed by Test-Fuchs GmbH from Austria, Auto AG Group from Switzerland and SFC Energy AG.



You can find out more information about the EFOY Hydrogen Energy Solutions at efoy-pro.com/energy-solutions

Coming soon

EFOY H₂PowerPack

The emission-free plug & play energy solution with hydrogen fuel cells

The hydrogen fuel cell integrated in the H₂PowerPack delivers an output of 50 kW and can be clustered up to 200 kW. With the standard CEE plug, the 300 bar hydrogen interface and the integrated display, the H₂PowerPack is easy to operate and can be used plug & play. By using a small high-performance buffer battery, the entire system is also comparatively small, light and compact and therefore easy to handle. The H₂PowerPack is therefore the ideal emission-free energy solution for off-grid and on-grid backup applications up to 200 kW.



Reference applications for professional users

» Cameras on construction sites contribute to traffic safety. With mobile solutions, the cameras can be relocated in a short space of time to keep an eye on what's happening on the construction site at all times. With an autonomous power supply for mobile camera systems, you are independent of the power grid and flexible in the positioning of the cameras. «

Ulrich Haspel, Bayerische Straßenbauverwaltung








Traffic engineering

Challenge

Reliable power supply for temporary construction site management systems, trailer-based installations, such as LED displays, off-grid traffic control systems on highway bridges and mobile applications, such as traffic counters, radar systems or video/web cam monitoring.

Solution

-  EFOY Pro 900
-  EFOY ProCabinet 2020S
-  2x M10 fuel cartridges
-  Fuel Manager FM2
-  30 days of self sufficiency @ 30 W









Early detection of natural disasters

Challenge

An uninterruptible off-grid power supply for temporary applications, such as thermal imaging cameras as an early detection of forest and smouldering fires, fires at landfills and volcano monitoring.

Solution

-  EFOY 150
-  EFOY ProCube 2060A
-  2x M28 fuel cartridges
-  Fuel Manager FM2
-  1,200 Wp Solar
-  6 months of self sufficiency @ 50 W



» EFOY Pro Fuel Cells supply monitoring stations around volcano peaks with power so they can predict eruptions and therefore save human lives. These stations are located at up to 3,000 m above sea level and prove the EFOY Pro's reliability under extreme conditions. The remote monitoring allows us to monitor the status of the fuel cell. Downtime is minimised and the long self sufficiency saves us helicopter flights and therefore operating costs. «

Marco Levi, Hydro2Power SRL





On-board power supply for special vehicles

Challenge

Ensuring a reliable and continuous on-board power supply for the technology operated in and on the vehicle, such as special signaling systems and communications technology. Without an additional power supply, the required energy needed to charge the batteries could previously only be met with the vehicle's engine running.

Solution

- 🔌 EFOY Pro 2800
- 🔌 1x M10 fuel cartridge
- 🔌 Integration into a team transporter
- 🔌 A reliable, self-sufficient on-board power supply for the entire duration of use



» With EFOY Pro, we can permanently operate the vehicle's entire electronics when stationary with the engine switched off. This doesn't just save us fuel and increase the duration of the call-out but also reduces logistical complexity. Another benefit is the unbeatable safety and constant availability of the fuel cartridges. The fuel cell is located in the rear section of the emergency vehicle and connected to the battery.«

Marco Torriani, commanding officer, Brunnthäl volunteer fire brigade

» There are many innovative solutions and technologies for surveillance on the market. However, without power, these solutions are useless. A reliable power source is the key to success.«

Ken Pereira, CEO Oneberry Technologies



Stationary video monitoring systems

Challenge

An uninterruptible, off-grid power supply for stationary applications and for monitoring critical infrastructures. This includes video monitoring systems for construction sites, railway crossings, for observing wildlife, as well as for monitoring and securing public places and gatherings.

Solution

- 🔌 EFOY Pro 1800
- 🔌 2x M10 fuel cartridges
- 🔌 Fuel Manager FM2
- 🔌 250 Wp Solar
- 🔌 16 days of self sufficiency @ 60 W





Mobile video monitoring systems

Challenge

A quick and easy to install uninterrupted, off-grid power supply for mobile applications without fixed infrastructure. These include video surveillance systems for monitoring construction sites, railroad crossings, critical infrastructure, wildlife observation, super-market parking lots and monitoring and securing public places.

Solution

- 🔋 EFOY Pro 2800
- 🔋 Fuel Manager FM2
- 🔋 2x M28 fuel cartridges
- 🔋 For the entire duration of the event



» The EFOY Pro allows WCCTV to provide temporary and rapid deployment CCTV services in the most remote locations in a cost effective and reliable manner. We have utilised the EFOY Pro fuel cell solution for close to 10 years to provide power to our CCTV Towers. We have found the solution to be reliable and perfectly adapted to our requirements. «

Daniel del Soldato, Wireless CCTV Ltd.

» During the expedition, we were only able to access our remote sites at infrequent intervals, but through remote monitoring we could ensure that operations were maintained at these sites. Importantly, due to the COVID-19 pandemic, our research vessel and all research personnel had to leave the sea ice for more than a month. During this time, the EFOY Pro kept our systems continuously running during a very important time, allowing our ASFS to capture the important transition that occurs during the onset of the summer melt season. «

Matthew Shupe, Senior Research Scientist, National Oceanic and Atmospheric Administration (NOAA), Boulder, Colorado



Measurement stations for recording environmental data

Challenge

The seamless recording of environmental data at off-grid locations requires a reliable and weather-independent power supply. This requires an addition or alternative to the weather-dependent solar power to be able to seamlessly record data regarding noise emissions, water levels, seismic movements as well as weather and climate data.

Solution

- 🔋 EFOY Pro 2800
- 🔋 EFOY ProEnergyBox 4060P
- 🔋 2x MT60 fuel cartridges
- 🔋 Fuel Manager FM2
- 🔋 60-90 days autonomy @ 60-100 W



» Modern Resources has committed to working in an environmentally friendly manner. That is why we chose to use the EFOY Pro Fuel Cells in hybrid operation with solar, because this is the best and most sustainable option to ensure a reliable power supply for our application year-round. The EFOY Pro works reliably and autonomously year-round, even under harsh winter weather conditions. The minimum effort changing fuel cartridges and the extremely low CO₂ emissions make the EFOY Pro the most efficient and environmentally friendly choice. «

James Martin, Operations Manager, Modern Resources, AB, Canada



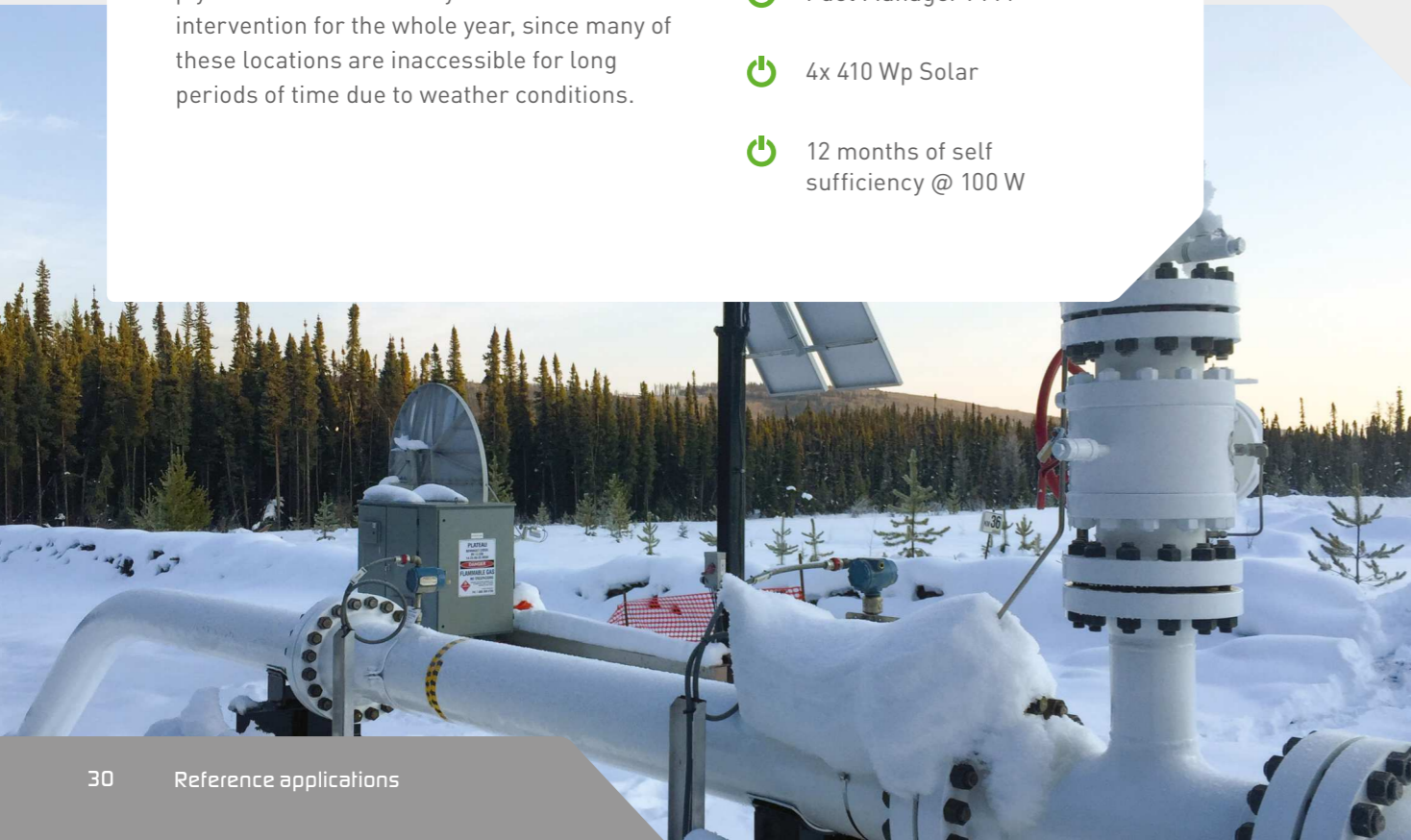
Oil & gas applications

Challenge

The power supply for critical loads in remote locations in the oil and gas sector as well as mining is a challenge and requires a reliable power source that works autonomously for long periods of time. Whether for SCADA & telemetry, valve actuation, leak detection, telecommunication or CCTV, the power supply needs to work reliably with minimum user intervention for the whole year, since many of these locations are inaccessible for long periods of time due to weather conditions.

Solution

- 🔌 EFOY Pro 2800
- 🔌 EFOY ProCabinet 4120SX
- 🔌 4x M28 fuel cartridges
- 🔌 Fuel Manager FM4
- 🔌 4x 410 Wp Solar
- 🔌 12 months of self sufficiency @ 100 W



Traffic engineering

Challenge

To increase safety in road and rail traffic, a reliable power supply independent of weather conditions must be ensured. The systems that promote safety include, for example, road weather stations to detect black ice, stationary and mobile radar cameras to enforce speed limits, temporary construction site and traffic control systems, traffic counting systems as well as off-grid applications, such as points and signalling technology with multiple, short power peaks per day.

Solution

- 🔌 EFOY Pro 2800
- 🔌 EFOY ProCabinet 2130A
- 🔌 4x M28 fuel cartridges
- 🔌 Fuel Manager FM4
- 🔌 60 days of self sufficiency @ 90 W

» Places with an increased danger of accident are usually located outside of populated areas and are therefore far away from the power grid. EFOY Pro Fuel Cells have proven to be the ideal solution both for the permanently stationary or mobile flexible operation of our traffic monitoring systems. The EFOY Pro ensures our technology is powered and quietly and reliably contributes to increased safety in road traffic. «

Dominik Schöner, Managing director of DMT Digitale Verkehrsmesstechnik



» Communication on British Columbia's northern coast can be a challenge. The elements in this mountainous region can take its toll on the communication systems. Thanks to our decades of experience in this region, we are used to these unique challenges and using the EFOY Pro Fuel Cells in a hybrid combination with solar power was the best and most environmentally friendly solution to ensure operation year-round. We chose this solution, because it can work autonomously and reliably year-round, even in wintry weather conditions, with minimum effort required. «

Rob Dykman, Managing director, Coast Mountain Wireless, BC, Canada

Mining

Challenge

A safe, reliable wireless communication network is just as important to operate a modern mine as is the mining equipment itself in order to increase productivity, lower maintenance costs and increase safety. Since mines largely use autonomous vehicles, supplying critical communication loads in the most difficult and remote environments requires a reliable solution that can operate autonomously for long periods of time. No matter whether it is a mobile communication and video monitoring trailer that moves when the mine's terrain continues to change or a fixed communication repeater tower. The power supply needs to be 100 per cent ensured in order to avoid extremely costly equipment failures.

Solution

- 🔋 2x EFOY Pro 2800
- 🔋 EFOY ProTrailer 4120T
- 🔋 4x M28 fuel cartridges
- 🔋 2x Fuel Manager FM2
- 🔋 4x 410 Wp Solar
- 🔋 12 months of self sufficiency @ 125 W



Wind measurement systems

Challenge

A reliable power supply for the seamless data acquisition of wind profiles with LiDAR and SoDAR devices to evaluate possible on-shore and off-shore wind farm investments and locations.

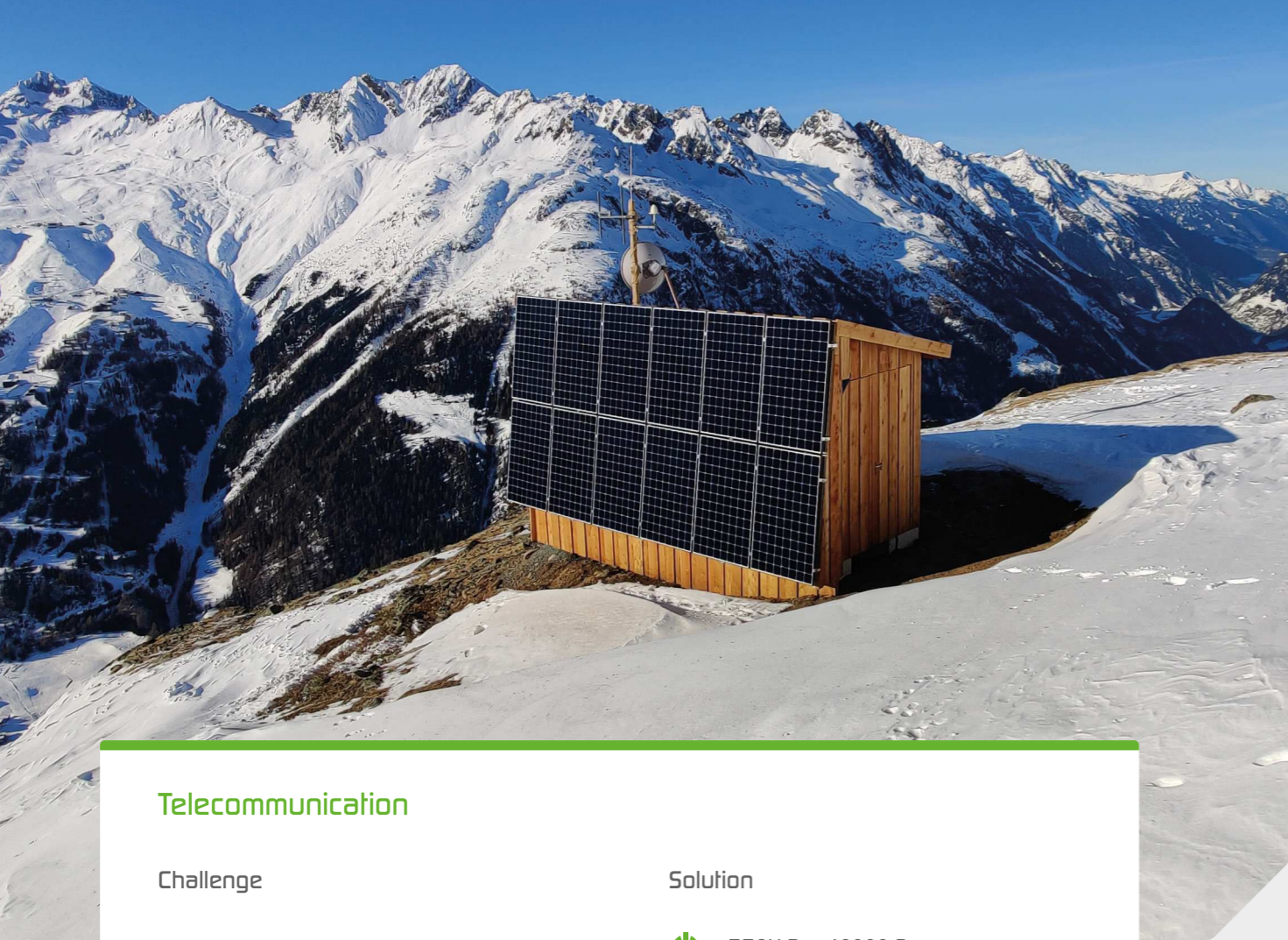
Solution

- 🔋 4x EFOY Pro 2800
- 🔋 16x M28 fuel cartridges
- 🔋 4x Fuel Manager FM4
- 🔋 4x 50 Wp Solar
- 🔋 Up to 5 months of self sufficiency @ 100 W



» In the medium to long-term, fuel cells are more cost effective compared to other energy sources. Capable of being fully integrated and therefore protected from the outside environment, fuel cells are maintenance-free and convince with very predictable operating times. «

Vegar Neshaug, Product Manager, SEAWATCH Wind LiDAR Buoy







Telecommunication

Challenge

Weather-independent and reliable power supply for off-grid applications such as transmitters, repeater stations or switch and signal technology with multiple, short power peaks per day. Power supply for a local microgrid and closing of supply gaps in remote, rural areas where the power demand cannot be reliably met with solar modules.

Solution

-  EFOY Pro 12000 Duo
-  4x MT60 fuel cartridges
-  4,320 Wp Solar
-  Autonomy over the entire winter season



» Using EFOY made it possible to use this optimal radio location. Low maintenance required, no oils, independent frost protection function, hardly any noise generation and no exhaust gases. The EFOY was developed specifically for our application area. «

Ing. Manuel Köll, Bergbahnen Sölden

» Fuel cells are increasingly in demand from Indian customers, especially government agencies, due to their high reliability, low maintenance and massive logistical advantages. They play an important role wherever conventional energy suppliers cannot be relied upon. «

Karandeep Singh, Managing Director, FC TecNrgy Pvt Ltd.







Microgrids

Challenge

Ensuring an uninterrupted, environmentally friendly power supply in off-grid areas or to safeguard the power grid in the event of malfunctions and grid failures.

Solution

-  2x EFOY Pro 12000 Duo
-  5,000 Wp Solar
-  4x M28 fuel cartridges
-  Autonomy: approx. 30 days



» SFC's vast expertise and know-how was crucial to the successful implementation of this project. We are convinced of the professionalism and quality of the emission-free solutions by SFC. «

Michael Haring, Netze Duisburg Head of Operating Technology



Critical infrastructures

Challenge

Ensuring an emergency power supply for safety-relevant applications such as the digital radio of authorities and organizations with security tasks for at least 72 hours. Applications in the areas of mobile radio, energy, gas and water supply, control centers in traffic engineering or energy supply are also part of the critical infrastructure and must remain operational in the event of an emergency.

Solution

- 🔌 EFOY H₂Cabinet X-Series
- 🔌 4x EFOY Hydrogen 2.5
- 🔌 Hydrogen bundle 54 x 50 l (300 bar)
- 🔌 Autonomy: 900 kWh (110 hours @ 8 kW)



© Visualisation: SWAP Architektur | JANUSCH - the visual collective | SAN Group

Climate neutral business parks

Challenge

Ensuring an environmentally friendly energy supply for self-sufficient and climate-neutral business parks. Fully integrated energy concepts use surplus solar energy to produce hydrogen. The hydrogen produced by electrolysis is stored in separate high-pressure tanks. In order to continue to supply the site with energy in the event of a power outage or a lack of sunshine hours, a back-up power supply system is required, which is operated with the separately stored hydrogen.

Solution

- 🔌 5x EFOY H₂Cabinet of 10 kW each (50 kW total system output)
- 🔌 4x EFOY Hydrogen 2.5 modules per EFOY H₂Cabinet X-series
- 🔌 EFOY H₂Cabinets are connected to hydrogen tanks
- 🔌 Autonomy: 100% self-sufficient in the sunny months thanks to solar and hydrogen systems



» Our system focuses on the possibility to save and use solar energy 24 hours a day. The fully integrated energy concept with waste heat utilization and reverse power generation of the excess hydrogen will supply the entire SAN Group site in the future. The EFOY H₂Cabinet is the ideal secondary power supply for our fully autonomous energy concept and provides fully automatic access to our saved hydrogen in the event of a power outage. «



Martin Blauensteiner, Managing Director SAN Venture and Project Manager

Which EFOY is the right one for me?

Use our model check to determine the model that suits your needs.

my-efoy.com/model-check

Advantages of the EFOY Fuel Cells

-  Compact and lightweight
-  Fully automatic and maintenance-free
-  Environmentally friendly and quiet

EFOY Fuel Cells in the leisure sector

The EFOY 80, 150 and EFOY Pro 2800 are practical power generators in motor homes, boats and cabins and offer complete independence from the power grid. Once installed, the EFOY Fuel Cell completely automatically recharges 12 and 24 V on-board batteries. You can enjoy your holiday undisturbed thanks to the environmentally friendly and quiet functionality. The EFOY Fuel Cells charge all common types of batteries. You get the most efficient solution with the EFOY Hybrid Power, which is a perfectly coordinated powerhouse, consisting of an EFOY Fuel Cell and EFOY Lithium Battery.

Your freedom. Your power. The perfect power supply for any need.

Vehicle type



Energy demand/travel behaviour

35 –60 Ah / day
Power supply for long weekends

Recommendation



Vehicle type



Energy demand/travel behaviour

55–120 Ah / day
Comfort vacation in any season

Recommendation



Vehicle type



Energy demand/travel behaviour

120–200 Ah / day
Superior travel experience with high energy demand

Recommendation



Control of the EFOY

You can easily control your EFOY from your smartphone/tablet via the EFOY App. Just plug the EFOY Bluetooth Adapter into the fuel cell. The app will give you an overview of all of the information regarding your fuel cell and the battery, such as the fill level of the fuel cartridge or the daily consumption.



Apple App Store



Google Play Store

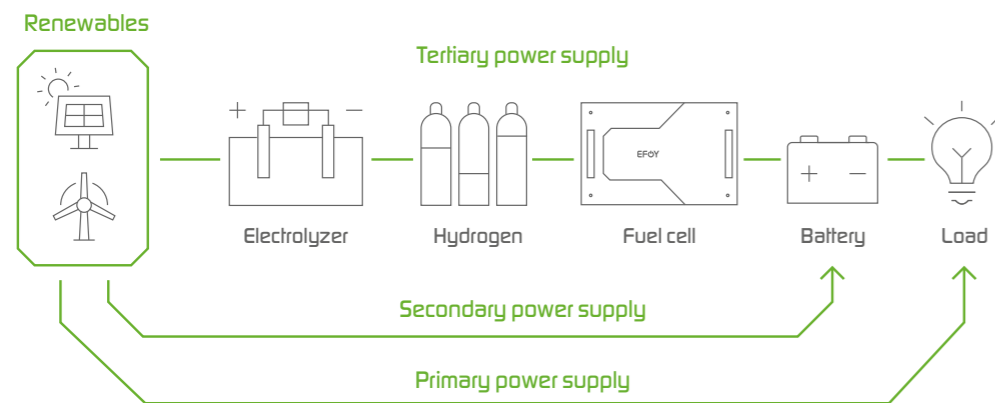
You can find technical data on our website at my-efoy.com

Hydrogen

Hydrogen as an energy carrier plays an important role worldwide in the decarbonization of the economy. For the long-term success of the energy transition and to achieve climate targets, hydrogen is the alternative to fossil fuels. Hydrogen produced in a climate-friendly way makes it possible to significantly reduce CO₂ emissions and plays the key role in the race to zero. EFOY Hydrogen Fuel Cells produce emission-free electricity from hydrogen, and do so very efficiently and with high availability. The hydrogen supply for our EFOY Hydrogen Fuel Cells is designed to be flexible, and can be supplied from either commercially available hydrogen 3.0 steel cylinders, cylinder bundles or entire containers.

Emission-free energy for a climate-neutral future

Hydrogen is a clean energy source. When used to power a fuel cell, the only by-products are waste heat and water vapour. Using green hydrogen in a fuel cell, generated from renewable energy sources, such as wind and solar, the resulting energy is carbon neutral. By replacing diesel generators with fuel cells, you can significantly reduce your carbon footprint. Furthermore, hydrogen can be generated onsite at the application, thus reducing the carbon footprint of the energy system value-chain.



EFOY Fuel Cartridges

EFOY direct methanol fuel cells from SFC are operated using methanol. The methanol is stored in EFOY Fuel Cartridges that have been designed especially for this purpose. Depending on requirements, EFOY Fuel Cartridges are available in 5, 10, 28 and 60 litre capacities. High-purity methanol is needed to reliably operate the EFOY Fuel Cells. To ensure compliance with the strictest safety standards, each filling operation is supervised by SFC Quality Management. Only when original EFOY Fuel Cartridges are used, can the maximum operating life of the fuel cell be guaranteed.

According to the CLP Regulation, methanol is categorised as a poisonous and easily flammable substance. You can find more information in the safety data sheets in the download area of our website efoy-pro.com/downloads-en



| The EFOY Fuel Cartridge | M5 | M10 | M28 ¹ | MT60 |
|-------------------------|--------------------|--------------------|--------------------|--------------------|
| Contents | 5 litres | 10 litres | 28 litres | 60 litres |
| Weight | 4.3 kg | 8.4 kg | 23.4 kg | 55 kg |
| Nominal capacity | 5.6 kWh | 11.1 kWh | 31.1 kWh | 66.7 kWh |
| Size (L x W x H) | 190 x 145 x 283 mm | 230 x 193 x 318 mm | 370 x 285 x 395 mm | 340 x 390 x 670 mm |
| Autonomy @ 50 W | 111 hours | 222 hours | 622 hours | 1,333 hours |

¹ M28 adapter required



Safety-tested

EFOY Fuel Cartridges have been designed to meet the strictest safety standards and have received UN approval for transportation by sea, road and air. Their design ensures that the user is never at risk of coming into contact with their contents.

Global fuel cartridge logistics

SFC has established a global logistics network for the sale of EFOY Fuel Cartridges. EFOY Fuel Cartridges are available from SFC retailers worldwide. EFOY Fuel Cartridges can also be transported on pallets via road, sea and air.

High energy density

The high energy density of methanol provides a lot of energy in a very small space with EFOY Fuel Cartridges. 10 litres of methanol has a capacity of 11.1 kWh of energy and weighs just 8.4 kg. To deliver the same quantity of energy, around 280 kg of lead-gel batteries would be needed. As a result, the autonomy of your off-grid application can be increased many times.

SFC Energy

SFC Energy AG is a leading supplier of hydrogen and direct methanol fuel cells for stationary and mobile hybrid power supply solutions. With over 65,000 fuel cells sold worldwide to date, we are a sustainably profitable fuel cell producer. With continuous investments in research and development, we are constantly working towards further expanding our technology leadership for mobile and off-grid energy solutions. Our fuel cells are 'made in Germany' and are developed and produced at the head office in Brunnthal near Munich. Additional offices are located in the Netherlands, Romania, Canada, India, USA and Great Britain. As a company, SFC has over 20 years of experience in developing, producing and selling fuel cells. SFC therefore stands for off-grid, environmentally friendly fuel cell solutions with the highest quality standards and the best service.

in excess of

65,000

fuel cells sold

7

Locations

Germany
Canada
The Netherlands
Romania
India
Great Britain
USA

403

employees

5,400 t

of CO₂ saved

10 Mio MWh

 of environmentally friendly energy generated

Gain know-how in our trainings and webinars for the successful use of your fuel cells.

efoy-pro.com/sfcenergy-academy

We look forward to hearing from you!

Phone: +49 89 673 592-0

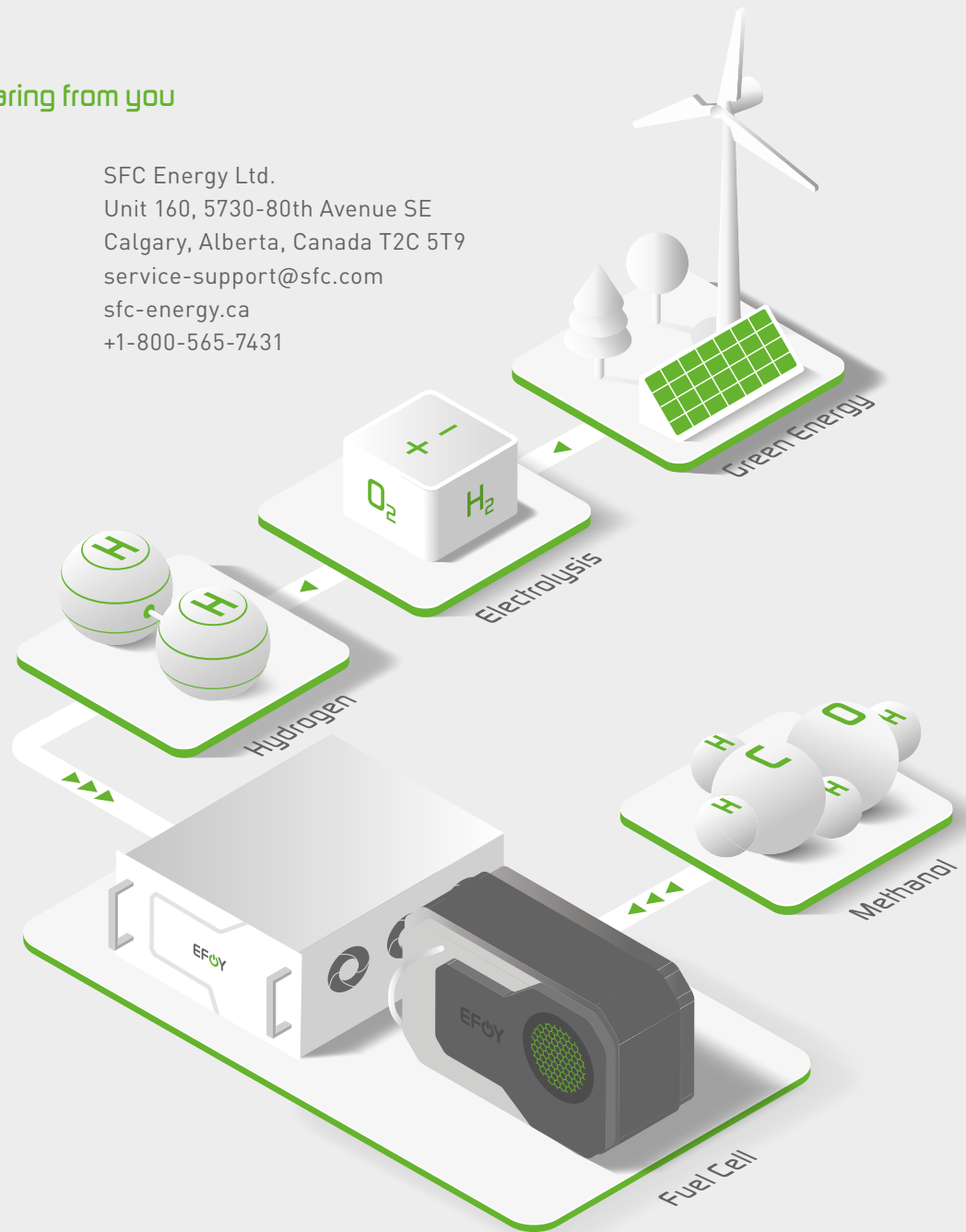
Email: sales@sfc.com

Clean energy for generations. Anytime, anywhere.

We look forward to hearing from you

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SFC Energy Partner