



EFOY Pro Fuel Cells

Off-grid Power for remote applications
in cold climates

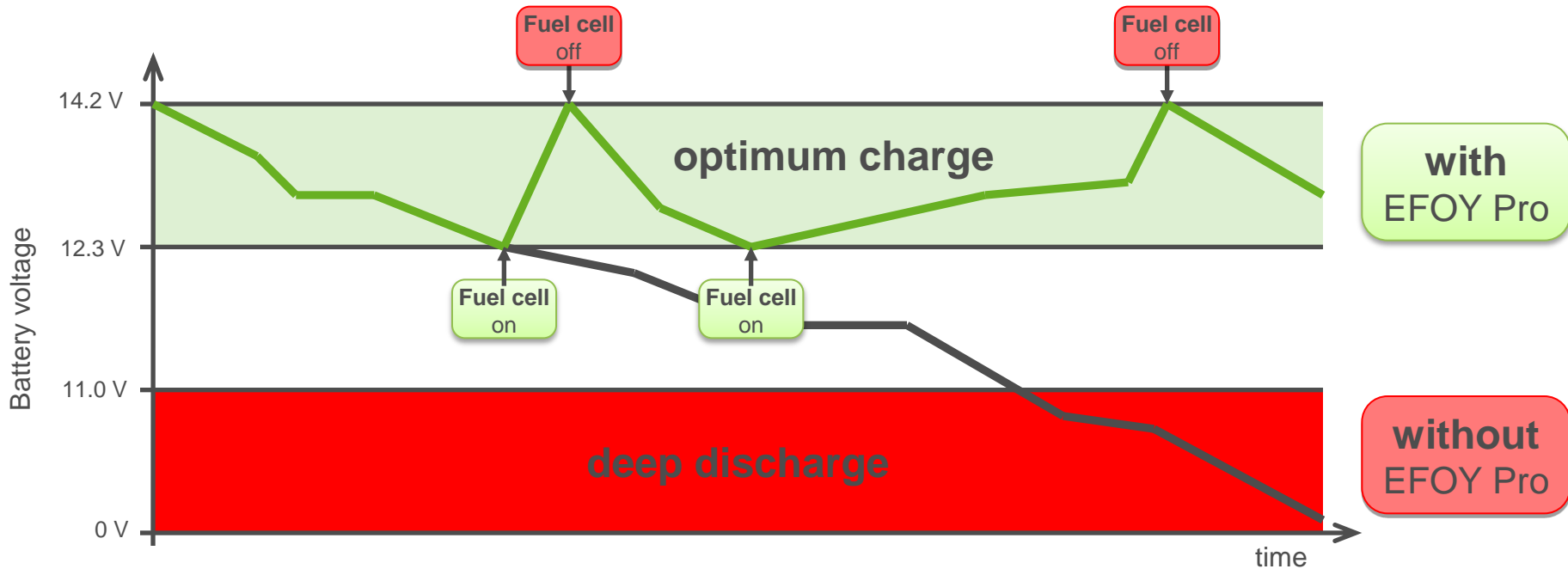


The Fuel Cell Technology

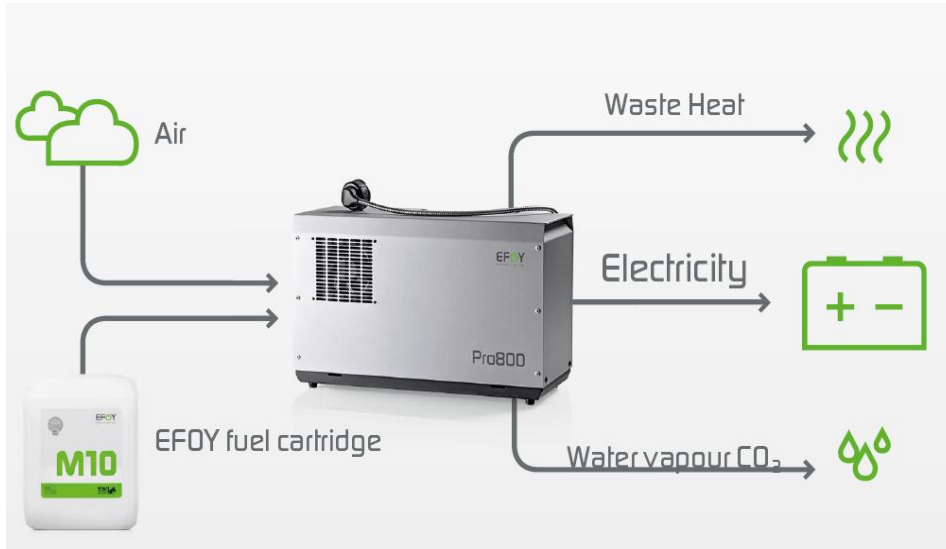


Pro Series
Made by SFC

The Fuel Cell Technology



The Fuel Cell Technology



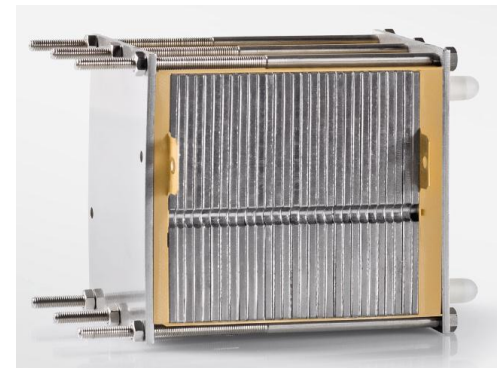
DMFC fuel cell generators are the ideal energy solution for off-grid and mobile applications.

Connect - switch on - forget

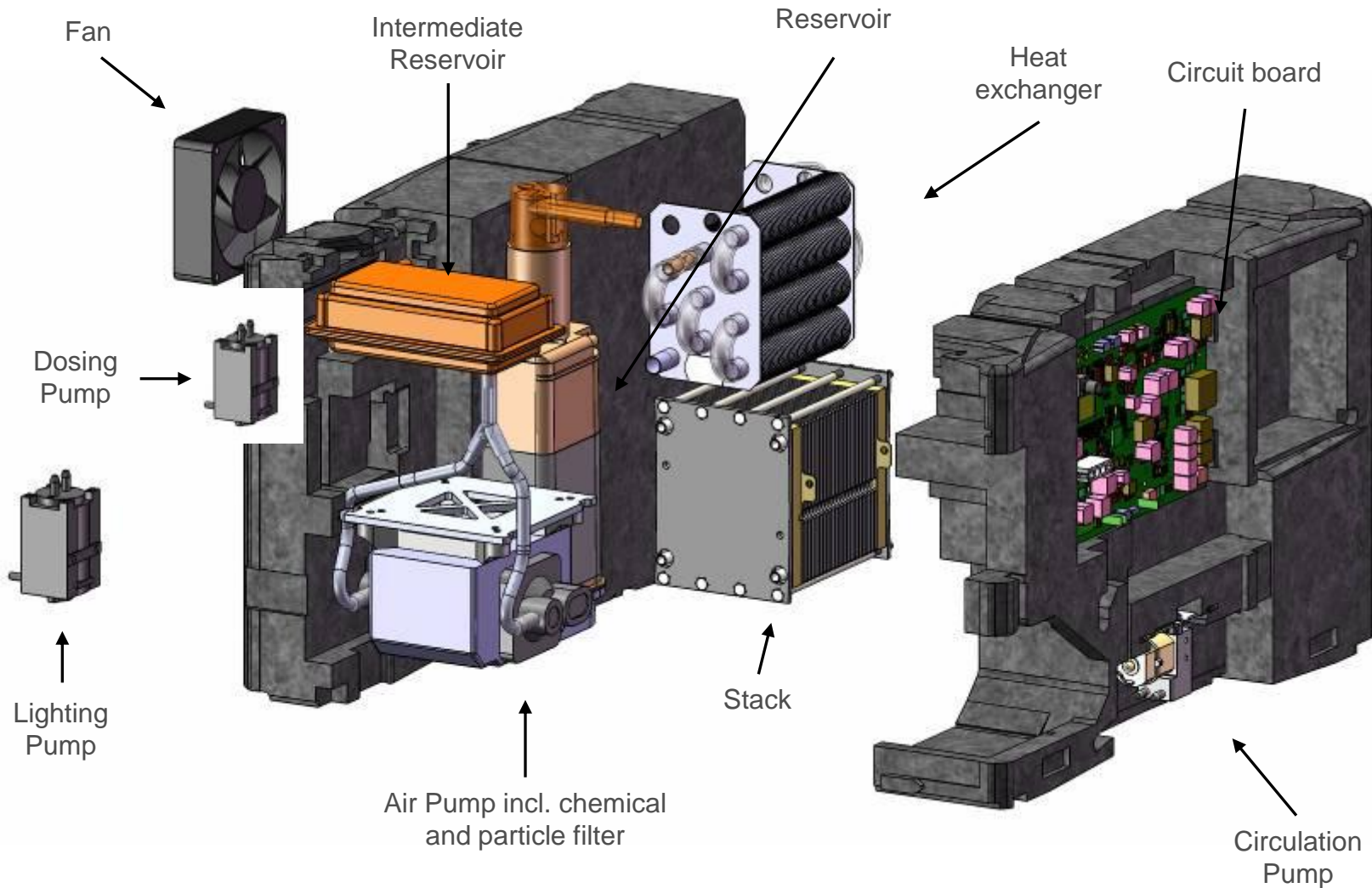
SFC fuel cell generators are smart energy producers that can be used to continuously and fully automatically recharge batteries. To do this, the fuel cell generator is connected directly to the battery that supplies consumers and monitors its charge level. Depending on the demand, the fuel cell generator turns on completely automatically, recharges the battery and then switches to standby - without any need for maintenance or intervention on the part of the user.

More power than solar

The EFOY Pro fuel cell generator supplies electricity at any time of the year or day, making it completely independent of the weather. The EFOY Pro supplies 3 to 10 times as much energy as a solar power system with the same output throughout the year. This is because, to produce as much energy as an EFOY Pro 800, you would need a solar power system with an output of up to 1600 Wp, depending on the country and time of year.



EFOY Pro Fuel Cell Components



New EFOY Pro Fuel Cell – More Autonomy

EFOY Pro	800	800 Duo	2400	2400 Duo
Max. nominal power*	45 W		110 W	
Min. nominal power*	25 W		80 W	
Nominal Voltage	12 V / 24 V		12 V / 24 V	
Min. charging current at 12 V / 24 V	2.1 A / 1.05 A		6.7 A / 3.3 A	
Weight	17.6 lbs (8.0 kg)	18.3 lbs (8.3 kg)	19.8 lbs (9.0 kg)	20.5 lbs (9.3 kg)
Connectable fuel cartridges (with DCS1)	1 (2)	2 (4)	1 (2)	2 (4)
Operating temperature	-4°F to +122°F (-20 °C bis +50 °C)			
Nominal consumption	0.24 gallons/kWh (0.9 l/kWh)			
Dimensions L x W x H	17 x 8 x 11 in (433 x 188 x 278 mm)			

* Nominal power decreases with the operation hours. Specification valid within warranty period.



< -40° C solution available only in special EFOY Pro Enclosures

EFOY Fuel Cartridges – High Energy Density

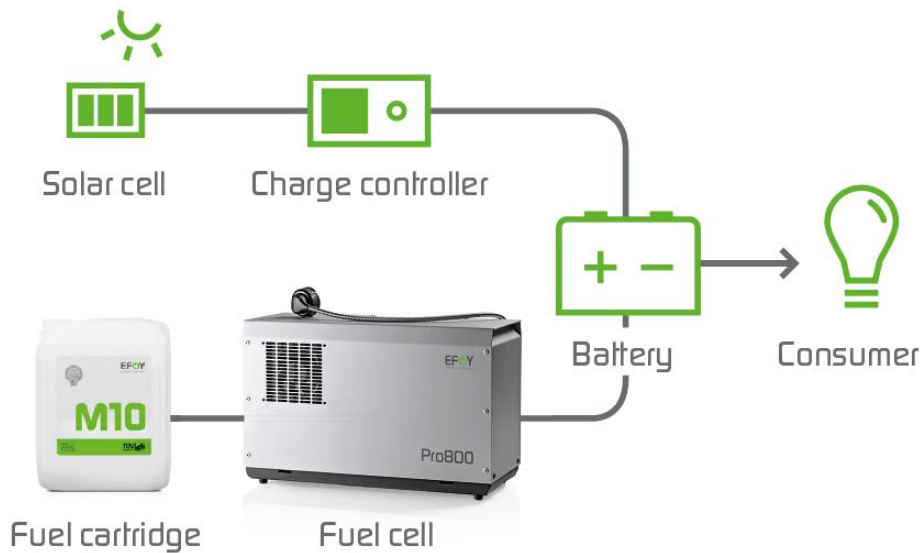
Fuel cartridges	M5	M10	M28
Volume	1.32 gallons (5 l)	2.64 gallons (10 l)	7.4 gallons (28 l)
Weight	9.5 lbs (4.3 kg)	18.5 lbs (8.4 kg)	48.5 lbs (22 kg)
Nominal Capacity	5.5 kWh	11.1 kWh	31.1 kWh
Size L x W x H	7.5 x 5.7 x 11.1 in (190 x 145 x 283 mm)	9.1 x 7.6 x 12.5 in (230 x 193 x 318 mm)	16.5 x 11.0 x 14.2 in (420 x 280 x 360 mm)



An example of an application with cont. 25 W:

EFOY Pro	800	800 Duo	800 Duo mit 2 DuoCartSwitch
Connected fuel cartridge(s)	1x M 28	2x M28	4x M28
Autonomy (in days)	51 days	103 days	207 days

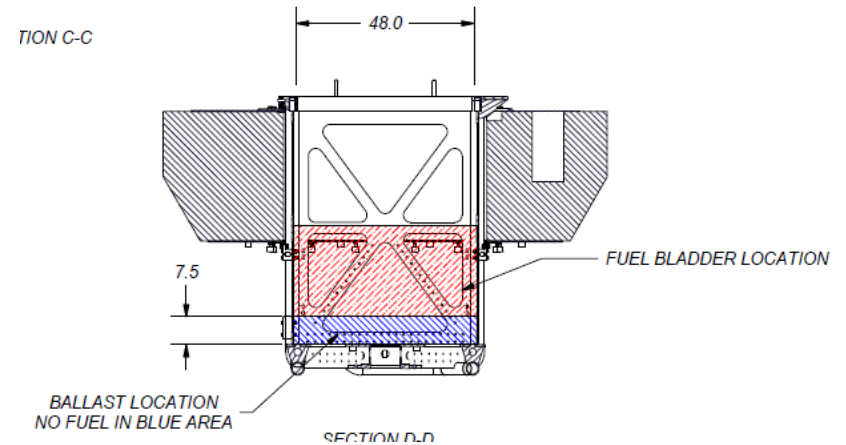
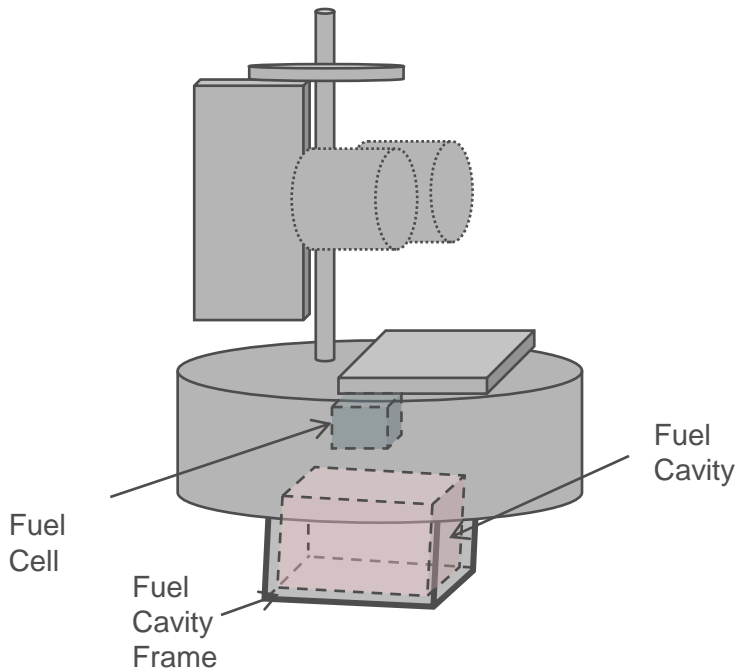
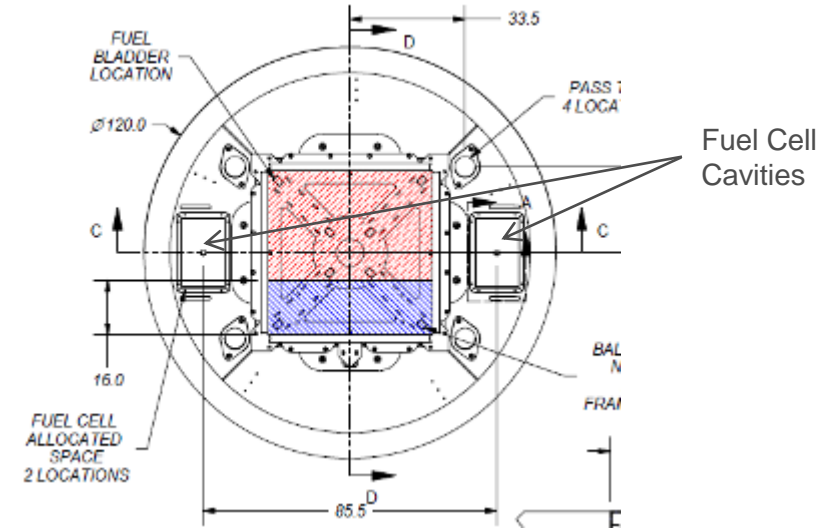
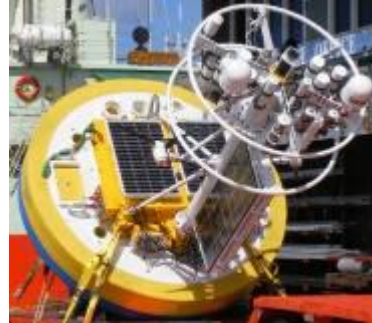
EFOY Pro Fuel Sells + Photovoltaic



The perfect solution for ensuring 100% availability with minimum fuel consumption is the use of an EFOY Pro fuel cell generator as a hybrid energy supply or as a back-up for a solar power system. When the solar system is unable to deliver enough power, the fuel cell generator automatically switches on and compensates the shortfall in energy. Complex designs for large solar power systems can therefore be avoided and the reliability of the system significantly increased.



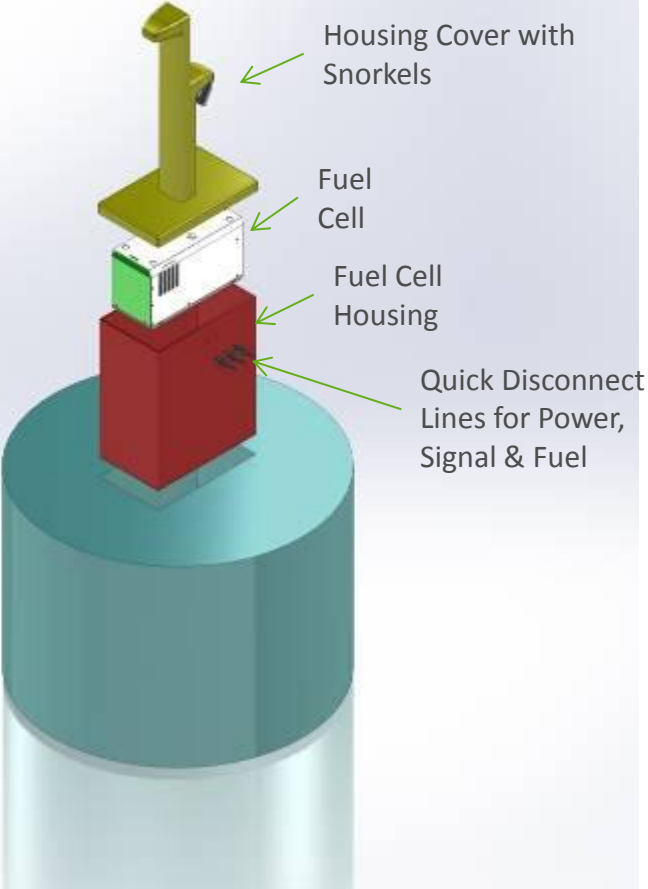
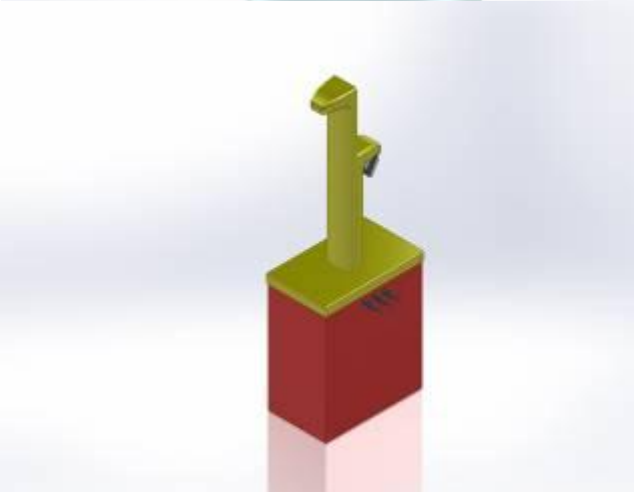
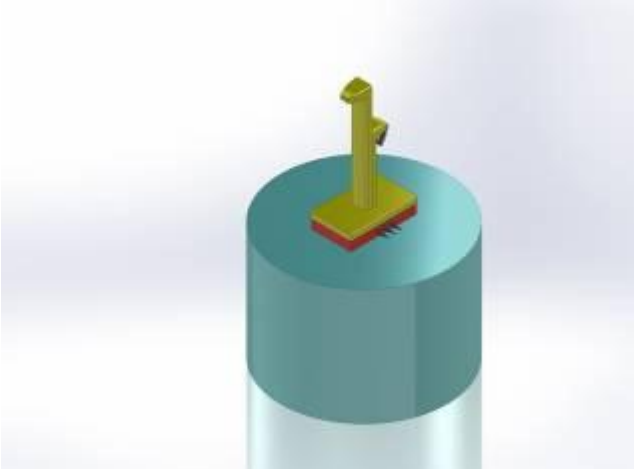
SFC Fuel Cell in Buoys – Early Design Concept



SFC Fuel Cell in Buoys – Module Concept



LBI
973 North Road, Groton, CT 06340



Mock Buoy

SFC Fuel Cell in Buoys – Module Design



Commercial
EMILY Methanol
Fuel Cell

- Increase Power to 150 Watt
- Sea water cooling (instead of air cooling)
- Fuel supply from 1000 liter bladder
- Water prove housing with snorkels



EFOY Fuel Cell In Sub-artic Environment



Sustained -35°C during the winter with lows of -40 to -50°C

excellent results putting an insulated exhaust line into a secondary collection chamber sized for roughly ~70-90% of the fuel cell cartridge volume.

Secondary chamber is then exhausted through the bottom of the enclosure (most is CO₂)



Minimal exhaust moisture amount

Open basement as elevation against drifting snow possible



PALAOA observatory, Antarctica



PALAOA is self-sufficient: solar cells and a wind generator supply the observatory with renewable energy 90% of the time.

During the months of darkness in the Antarctic winter and at temperatures down to **-50° C**, an EFOY fuel cell driven with methanol springs into action on windless days to guarantee continuous operation.

PALAOA, worldwide unique underwater acoustic observatory, celebrated 2013 its 7th anniversary – live sounds of seals and whales from Antarctica

Visit: www.awi.de/en

EFOY Fuel Cell at 11,000 feet



EFOY Fuel Cell at 11,000 feet



EFOY Fuel Cell In Sub-artic Environment



**12 Systems operated
by Shell Canada
14 Systems operated
by CNRL Canada**

**Sustained -35°C during
the winter with lows of -
40° to - 50°C**



Application Scenarios: Telecommunication



Base Transceiver Station
(Austria) since 2008



Internet via Radio Link Mast, EFOY Pro in Insulated
Outdoor Box (Norway)

Application Scenarios: Telecommunication



Base Transceiver Station
TETRA Radio (Italy)



Repeater Stations
EFOY Pro in Insulated Outdoor Box (Norway)

