

ENECO POWER[®]

ENECO POWER PRODUCT MANUAL

GUANGDONG ENECO POWER SCIENCE AND TECHNOLOGY CO.,LTD.



H₂O



Making the Green Power Everywhere



Guangdong ENeco POWER Science and Technology Co., Ltd. was established in 2013, which has got ISO9001:2015 Quality Management System Certificate, under the leadership of Dr. Xiang and his team, using the world's leading aqueous hydrogen technology and "Aqueous hydrogen" theory as the core. Our research and development include the MRFC series, PS3 series, FLASH series of aqueous hydrogen generators and other advanced fuel cell application products, especially aqueous generator MRFC-2 has got the EU CE Safety Certificate. We are committed to the application in telecommunication base stations and other related areas.

ENeco POWER has innovative R&D team and experienced technical service team, our mission is making the green power everywhere. Our products are widely used in telecommunication base stations, industrial equipment, villa residence, camping tourism and other fields. Providing customers with reliable, safe, environmentally friendly and convenient power supply solutions, we are committed to becoming the world's leading new energy technology company.

Our Culture

- Our Mission: Making the green power everywhere
- Team Culture: Wolves Culture, Eagle Spirit
- Our identity: The new power expert of telecom base station

Core Technology (Patents)

Fuel Reforming - 13 invention patents

Mastering a variety of fuel reforming of hydrogen reactor development and other engineering technology;

Fuel cell - 12 invention patents

Mastering the world's leading fuel cell system integration technology, with longevity, high reliability, low cost and other characteristics;

Hydrogen purification - 10 invention patents

Mastering a variety of different application scenarios of hydrogen purification and hydrogen production equipment technology, with great industrialization experience.

Part of patent list

Number	Patent Name	Patent Number	Patent Type
1	A system and method for utilizing biomass for power generation	201210277213.X	Invention patent
2	Protective gas of drying technology and process	2010106113414	Invention patent
3	Methanol blended water of power generation equipment	201220386541.9	Utility model
4	Methanol blended water produces hydrogen by reforming technology	201220468195.9	Utility model
5	Efficient system of methanol blended water produces hydrogen	201220467559.1	Utility model
6	Using methanol blended water for hydrogen production	201220468193.X	Utility model
7	Mobile system of methanol blended water for hydrogen production	201220713188.0	Utility model
8	A system of power generation	201320507449.8	Utility model
9	A hydrogen production equipment	201220127411.3	Utility model
10	A hydrogen production method	201220160857.6	Utility model

Our Service



Hydrogen generator

With the world's leading aqueous hydrogen technology, providing world-class aqueous hydrogen generators



Providing telecom base station power supply solution

Providing reliable, safe, environmentally friendly and convenient telecom base station solutions



Engineering services

Providing fuel cell and hydrogen related engineering and technical services



Other power supply solutions

Providing new energy solutions for other fields

Application Field

Telecom



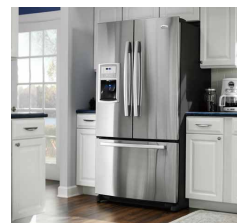
Industry



Residential



Family



Development Path

2013

ENECO POWER builded its team at home and abroad.

2014

R&D team developed and produced aqueous hydrogen generator MRFC-2.

2015

MRFC-2 was used as power supply for the first telecom station.

2016

ENECO POWER has been fully commercialized ncluding 6 telecom stations.

Future

We will keep providing reliable,safe ,environmental and convenient power supply solution for our customers.

Team Introduction

ENECO POWER is following the lead of Dr. Xiang and his team, mastering the world-leading aqueous hydrogen technology and fuel cell research experience, is committed to the application in telecom base station and other related fields. Our scientific R&D team comes from Tsinghua University, Shanghai Jiaotong University, Fudan University, South China University of Technology and other first-class colleges and universities, providing the best new energy power supply solution to our consumers.



Our Service

Flexible
solution

World-leading
technology

Safe and
green product

Deep
cooperation
in
extensive
market

Product Advantages

Stable
and reliable

High efficient
and
energy saving

Safe
and
environment
friendly

Low noise
and mute

Quality Assurance



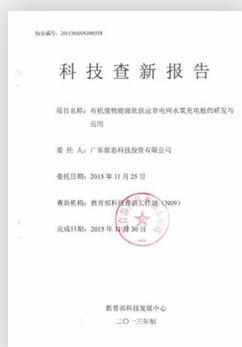
ISO 9001:2015
Quality Management System



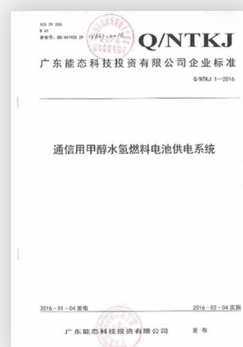
EU CE Safety Certificate



China Telecommunication
Technology Labs Report



ENECO POWER
Enterprise Standards, Science



Technology Novelty Retrieval Report



National Patent Certificate

4



ENECO POWER

Power Supply Solution of telecommunication Base Station

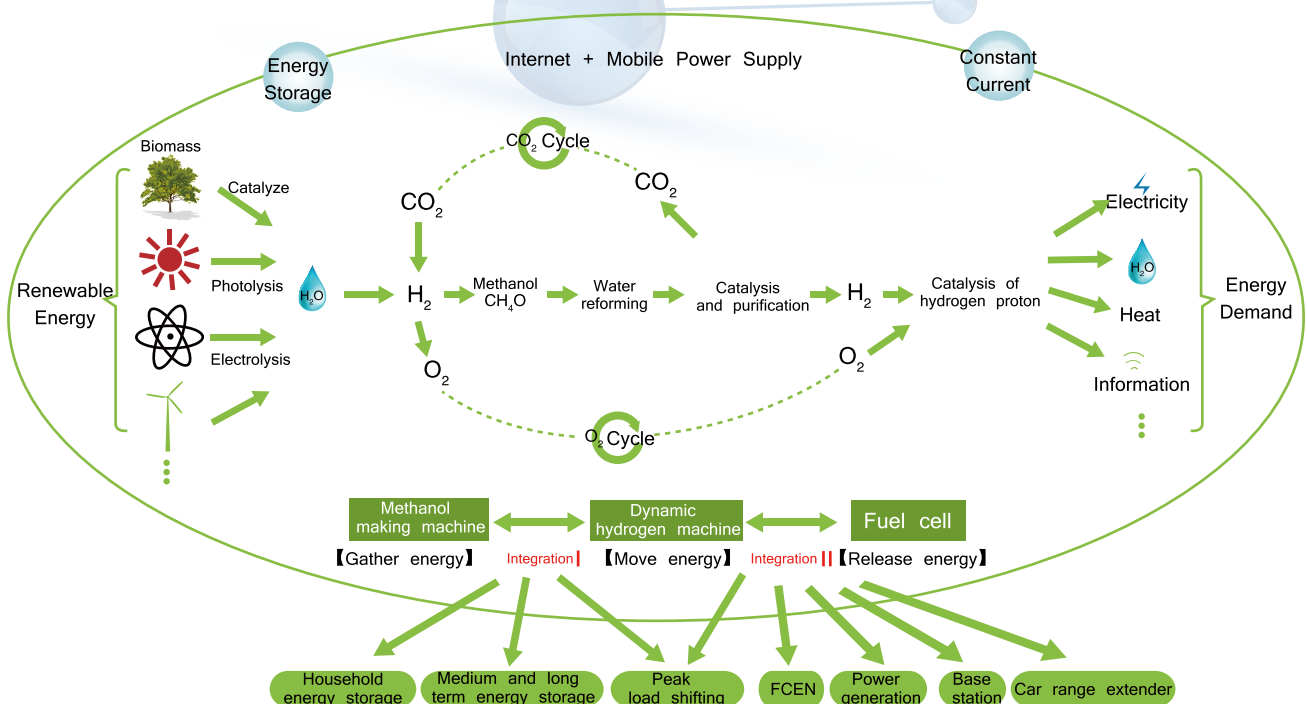
Why we choose aqueous hydrogen fuel?

Aqueous hydrogen fuel is composed of methanol and water according to certain proportion, which is very safe, efficient and environment-friendly new energy fuel. As well as aqueous hydrogen generator can provide customers with reliable, safe, environmental and convenient power supply. Aqueous hydrogen fuel is much safer than methanol and gasoline in the fuel, which has the advantages about freezing point and toxicity. Below are the data contrast of aqueous hydrogen fuel and other fuel. Ignition point means the lowest temperature continue to burn material heated in the air. The lower ignition point is, the easier to burn and more dangerous. Toxicity comparison uses the LD50 contrast in toxicology—median lethal dose. The LD50 value is smaller, the toxicity is stronger. In general, aqueous hydrogen fuel in combustion and toxicity are much safer and more reliable than gasoline.

Fuel Contrast	Aqueous hydrogen fuel	Methanol	Gasoline
Freezing point	>464℃	464℃	427℃
Flash point	-90℃	-97.8℃	-75℃
The Toxicity	>5628mg/kg	5628mg/kg	2500mg/kg

Why we choose methanol to make hydrogen?

Today we make methanol from the coal and natural gas, hence the cost of methanol is much cheaper than gasoline and diesel. Methanol can be made from the traditional fossil energy, can also be made from renewable energy sources such as solar energy, wind energy. We can also use crop straw, animal manure and fermentation of organic compounds to make methanol. Hence methanol is renewable fuel to convert the hydrogen.



Dr Xiang's water-based energy theory graph





Product Introduction

- ▶ Aqueous hydrogen generator MRFC-2
- ▶ Aqueous hydrogen generator PS3
- ▶ Aqueous hydrogen generator FLASH



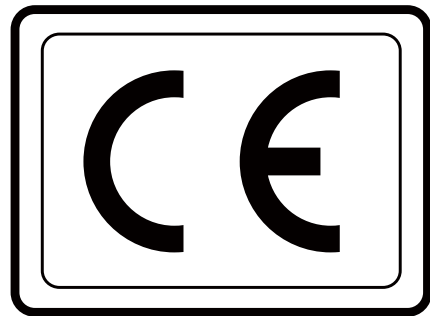


Aqueous hydrogen generator MRFC-2



► CE Certificate, Reliable and safe

Aqueous hydrogen generator MRFC-2 has got the EU CE safety certificate.



Product Introduction

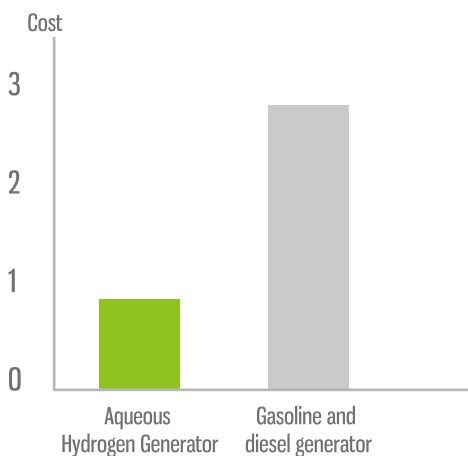
Aqueous hydrogen generator MRFC-2 series are new energy generator which are invented and developed by ENECO POWER, based on aqueous hydrogen technology, and converting chemical energy into electric energy by fuel cell.

Features

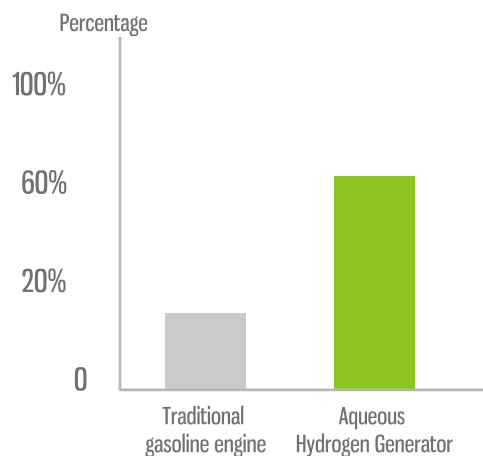
► Efficient, stable and continuous power generation

Aqueous hydrogen generator does not involve any combustion during power generation, which has more than 60 percent energy conversion efficiency than traditional gasoline / diesel generators. Besides, the cost of electricity generation is only about 1/3 - 1/2 of conventional gasoline /diesel generators.

Power generation costs



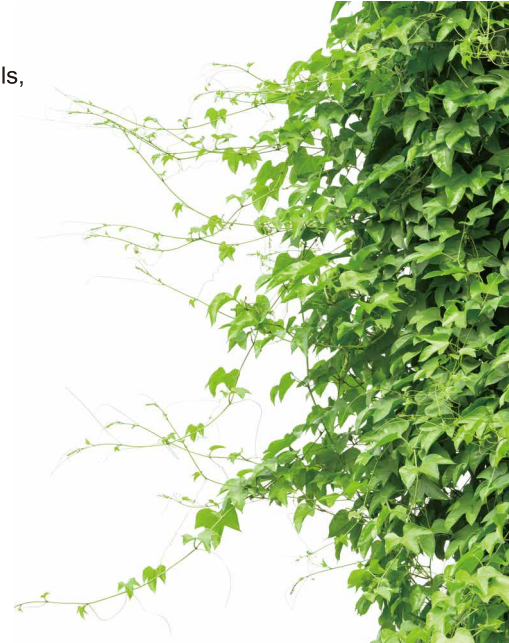
Energy conversion efficiency



► Low decibel, Zero noise pollution

Aqueous Hydrogen generator doesn't contain any moving parts inside except fuel pump and fan , the whole sound intensity is controlled within 55 decibels, which is almost zero noise pollution.

GB12348-1990 《 Noise standard of industrial enterprises》 dB (A)		
Area	Daytime	Night
Living, cultural and educational institutions	50	45
Residential, commercial and mixed areas	60	50
Industrial area	65	55
Areas in the city on both sides of the trunk	70	55



► Product parameters

Product Model	MRFC-DC2	MRFC-AC2
Rated Power	2kW	
Rated Voltage	48V DC	220V DC
Weight	136kg	
Size	1100×950×520mm	
Hydrogen Fuel	1 kg/kWh	
System Noise	<55dB	
Inseallation environment	Indoor and outdoor	
Operating environment	Good ventilation,-20°C~+45°C	

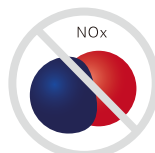
► Low operating cost

Aqueous hydrogen generator's service life is over 10 years or more. Our products are stable and reliable equipment which can operate for a very long time stably, to provide uninterrupted power supply.Besides,it is maintenance-free which can greatly reduce the operating costs zand maintenance costs.Moreover,MRFC-2 can run stably under extreme environment with strong adaptability.



► No pollution, Environment friendly

Aqueous hydrogen generator uses aqueous hydrogen technology to convert fuel into hydrogen by catalytic and reforming process , then convert hydrogen into electricity.There is no sulfur oxides, hydroxyl compounds, particulates,no PM2.5 emissions etc during the whole power generation process. The product is only small amount of carbon dioxide and water, and carbon emission is 0.458kg/KWh, which is truly safe and environmental friendly.



Product Comparison

Product Comparison	Battery	Aqueous Hydrogen Generator
Power supply time	Generally 4-6 hours	> 5000hrs
Life Expectancy	Average life expectancy of 2-4 years	10 years
Degree of pollution	Lots pollution in re-manufacturing and re-waste processes	Final products are carbon dioxide and water which are free of pollution
Whether need air conditioning	Yes	No
Whether can remote monitor	No	Yes

Product Comparison	Fuel Generator	Aqueous Hydrogen generator
Power Generation Cost	2.5 kW per hour	1.2 Yuan/kWh
Fuel	Gasoline / diesel and other fossil fuels	Aqueous hydrogen fuel
Reliability	Low reliability of high frequency use	The core components are without moving parts which are high reliability
Maintenance Frequency	Maintenance frequency is high, which needs 12-20 times first level maintenance ,4 times secondary level maintenance and one third level maintenance each 1000 hours	Maintenance frequency is low which needs 1-2 times normal inspection maintenance per year
Noise	Great noise and vibration	No noise pollution and the whole noise system is less than 55dB
Degree of pollution	Great polluted emissions of carbon dioxide, nitrides,sulfide and dust	Final products are carbon dioxide and water which are free of pollution
Whether can remote monitor	No	Yes



Aqueous Hydrogen generator



Battery



Fuel Generators

Aqueous Hydrogen Generator PS3



► Long life, low cost of operation and maintenance

Compared to the traditional gasoline / diesel generators, aqueous hydrogen have service life of more than 10 years. Aqueous hydrogen generators are stable and reliable equipment which can provide long-time and uninterrupted power supply.



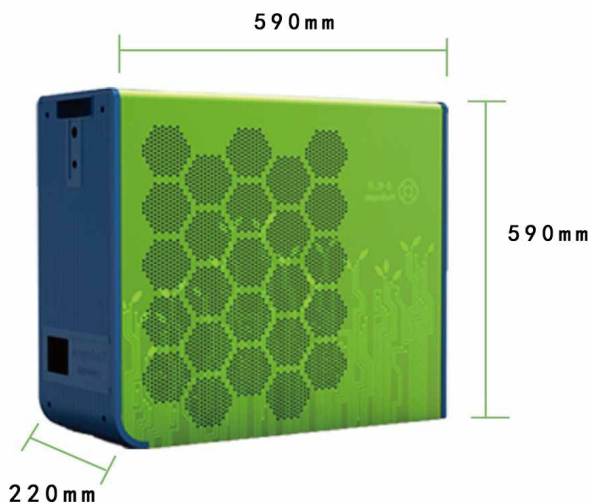
Product Introduction

Aqueous hydrogen generator PS3 series are new energy power generation devices that generate electricity through fuel cell with aqueous hydrogen fuel named MW63.

Product Features

► Light weight, Easy to carry

The real mobile power supply
—Aqueous hydrogen generator PS3 series, weights are less than 40kg, easy to carry and move.



► Product Parameters

Product Model	MRFC-PS3
Rated power	2.5kW
Rated voltage	220V AC/48V DC
Weight	39kg
Size	590×590×220mm
Hydrogen fuel	0.8 kg/kWh
System Noise	<55dB
Installation	Indoor and outdoor
Operating environment	Good ventilation, -20°C~+45°C



FLASH Aqueous Hydrogen Generator

► Product Parameters

Product model	FLASH
Additional equipments	One slow charging USB,two quick charging USB,portable refrigerator,electric fan,camping lamp and ENECO stereo.
Weight	On-board version 25kg, Portable version 16kg
Size	396X190X490mm
System Noise	<55db
Warm start-up time	90s
Using environment	Ventilation , -20°C~+55°C



Product Introduction

Aqueous Hydrogen generator FLASH series are high-tech new energy power generation device, which are designed for camping and traveling outsides.It converts clean energy aqueous hydrogen fuel through the fuel cell system to generate electricity , providing reliable, safe, environmentally friendly and convenient power supply to our customers.

Product Features

► Small size , Light weight , easy to carry to meet the traveling needs

The weight is less than 25 kg, easy to carry, truly portable equipment for traveling. FLASH's full set includes one slow charging USB,two quick charging USB,portable refrigerator,electric fan,camping lamp and ENECO stereo. It provides the convenience for camping, road trip, or family gatherings, etc.

► FLASH with push-button start , Easy to operate

FLASH is Equipped with four external expansion slots,three USB ports,two quick charging USB ports,one slow charging USB port,It can supply several loads at the same time .



Push-button start

4 external expansion slot

One slow charging USB port



Phone

420

Times



Tablet

125

Times



Refrigerator

2.5

Days



Camping
Lamp

30

Days



Stereo

6

Days



Fan

30

Days





Applications and services

- ▶ Service Introduction
- ▶ Part of the case
- ▶ Business Partner



Service Introduction

ENECO POWER products can be widely used in telecommunication base stations, industrial area, residential place as main power supply and backup power supply, provide customers with reliable, safe and environmentally friendly, convenient power supply.

► Main power supply

Aqueous hydrogen generators replace power supply to provide the Long-term electricity



Power supply provide the Long-term electricity



Aqueous hydrogen generators provide the long-term electricity

► Backup Pwer supply

Aqueous hydrogen generators use as backup power supply in fault area



Lead-acid battery provides the backup electricity



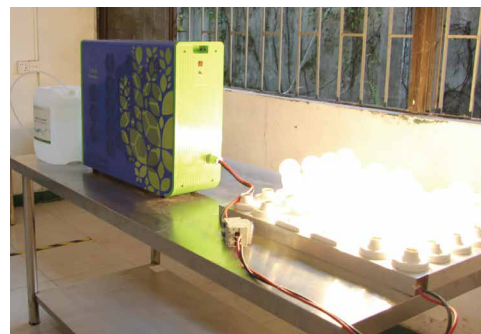
Aqueous hydrogen generators as backup power supply

► Emergency Power Supply

Aqueous hydrogen genetratyors use as emergency power supply in fault area



Emergency power supply car provides electricity



Emergency power supply car provide selectricity

Part of the case

ENECO POWER provides efficient power solutions to solve the persistent non-power problems in Guangzhou, Dongguan, Huizhou and other regions, not only significantly reduces their expenditure of maintenance and repair, but also greatly enhances the communication base station reliability and resistance to disaster.

Two 2kW aqueous hydrogen generators in parallel for Guangzhou Zengcheng Xiangshan base station



From December 19, 2015 to January 4, 2016
running for 17 days (total 408h)
providing 1,632kWh
uninterrupted power supply

One 2kW aqueous hydrogen generator for Huizhou Huidong base station



From January 24, 2016 to February 4, 2016
running for 12 days (total 288h)
providing 576kWh
uninterrupted power supply

Two 2kW aqueous hydrogen generators in parallel for Guangzhou Zengcheng Shapu base station



From January 7, 2016 to December 31, 2016.
running for 359 days (total 8,616h)
providing 43,080kWh
uninterrupted power supply

Two 2kW aqueous hydrogen Generators in parallel for Dongguan Chashan telecom Base station



From February 18, 2016 to December 31, 2016
running for 317 days (total 7,060h)
providing 38,040kWh
uninterrupted power supply

Four 2.5kW aqueous hydrogen generators in parallel for Guangzhou Zengcheng Nan xiangshan base station,



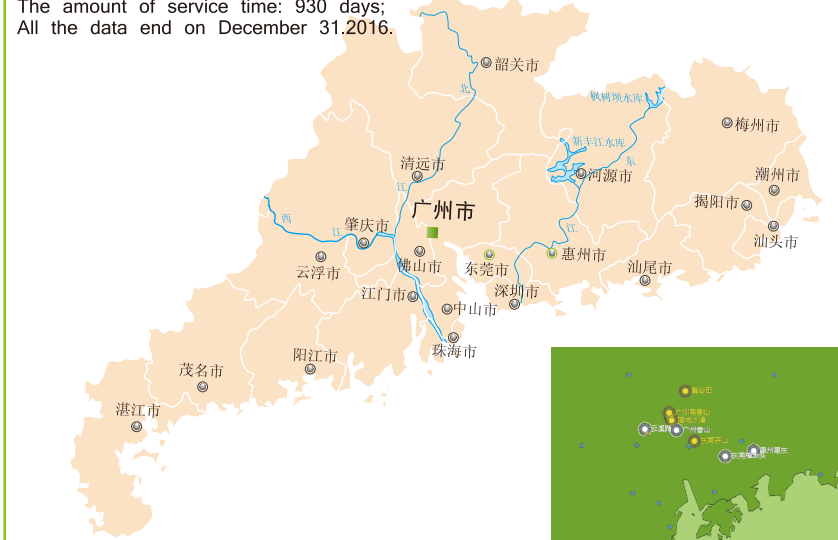
From August 27, 2016 to December 31, 2016
running for 126 days (total 3,024h)
providing 30,240kWh
uninterrupted power supply

Four 2.5kW aqueous hydrogen generators in parallel for Guangzhou Conghua Huang gutian base station



From October 31, 2016 to December 31, 2016
running for 61 days (total 1,464h)
providing 14,640kWh
uninterrupted power supply

The amount of cumulative power generation :135,120kWh;
Equivalent to 27,024 households daily electricity consumption;
The amount of service time: 930 days;
All the data end on December 31, 2016.



Four 2.5kW aqueous hydrogen generators in parallel for Guangzhou Conghua Shang Huanggutian Tian base station



From November 23, 2016 to December 31, 2016
running for 38 days (total 912h)
providing 9,120kWh
uninterrupted power supply

Business Partner

ENECO POWER has world-class aqueous hydrogen generators. We have mature industry chain, unique operating models, advanced customer service mechanism, complete internal management system. We provide an ideal platform for our ambitious co-partners. Let's step into new hydrogen energy era together—ENECO POWER invites you to join us!

Strategic Partners



BALLARD®



Our customer

CHINA TOWER
中国铁塔



Making the Green Power Everywhere



GUANGDONG ENECO POWER SCIENCE AND TECHNOLOGY CO.,LTD.

Address : No 18, Baidi Baixing 2nd Road, Zhangmutou Town, Dongguan, Guangdong, China

Phone : 0769-82113929

QQ : 2128335461

E-mail : enecopower@chinaeneco.com

Website : <http://www.chinaeneco.com>