扬华科创
YANGHUA STI

PRODUCT MANUAL

Full-scene solution provider of High current flexible bus

COMPANY INTRODUCTION

The expert of high current transmission and distribution

Yanghua STI is a high-tech enterprise focusing on the research, production, sales and service of high current transmission and distribution products.

At present, we have more than 40 relevant testing reports and patents, including various product testing reports such as flexible busbar type test , waterproof testing , combustion performance testing , as well as standard technical documents such as enterprise standards and flexible busbar construction and installation specifications. This is an innovative breakthrough in the field of high current transmission and distribution, and we are currently participating in the customization of national standard atlas.




“VISION

the leader of high current digital ecosystem service provider

“MISSION

Leading the New Era of High Current Transmission and Distribution

“VALUES

Innovation, responsibility, cooperation, sustainability

DEVELOPMENT COURSE

2013

Yanghua Technology was founded with the aim of becoming a leading supplier in the field of electromechanical equipment.

2016

Upgraded the positioning as a provider of electromechanical system solutions, and have reached deep cooperation with multiple rail transit groups.

2018

Yanghua Technology and the National Electrification Center of Southwest Jiaotong University have reached a strategic cooperation between industry, academia and research.

2020

Yanghua Technology has become an important service provider for Shenzhen Metro Group, contributing to the construction of multiple subway lines in Shenzhen.

2021

Yanghua Technology has applied for multiple patents for high current flexible busbar, filling the technological gap both domestically and internationally.

2023 · 6

Yanghua Technology fully established Yanghua STI.

2023 · 8

The first flexible busbar production line with independent intellectual property rights of Yanghua STI has been launched.

2023 · 9

The world's first high current flexible busbar has been successfully applied at Huawei Supercharging Station in Shenzhen.

2024 · 2

The first flexible busbar photovoltaic application project was electrified and accepted.

2024 · 4

The first flexible busbar energy storage project has been launched;
The first flexible busbar industrial plant project has landed.

2024 · 8

Establishment of a joint venture company and signing of a project cooperation agreement with the China Korea demonstration zone;
The Midea factory project has landed.

2024 · 10

CATL project landing;
The plant in southeast Asia project landing.

QUALITY ASSURANCE

Qualification

The high current flexiblebusbar has passed multipleproduct certifications such as ISO9001, ISO14001 , ISO45001, CE,etc. All models and specifications ofproducts have undergonevarious testing experiments such as fireresistance, combustion, waterproofing, and temperaturerise, and have obtained multiplereports such as combustion performancelabeling authorization,product testing reports, and type test reports. At the same time, theproduct is participating in theproduction of national standard atlas.

2 production lines

Fully independent intellectual property rights

3 laboratories

Research and development laboratory
Temperature rise current carrying capacity laboratory
High voltage withstand laboratory

4 product seires

General
Flame retardant
Fire-resistant
Low smoke and halogen-free

11 enterprise standards

Various product and application related standards

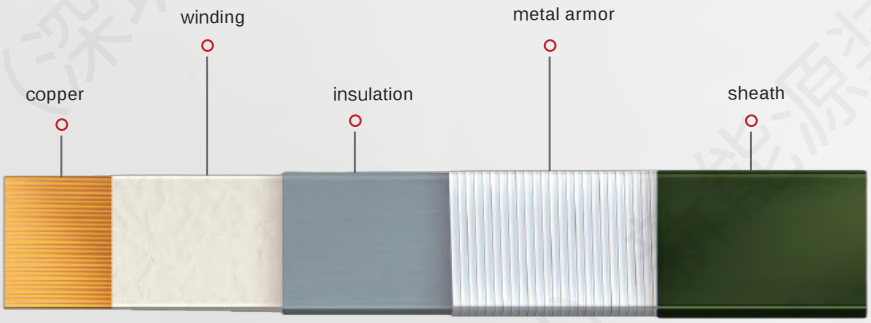
40 patents and testing reports

Materials, processes, equipment, applications, etc

PRODUCT INTRODUCTION

Flexible busbar

High current flexible busbar is made of high-purity copper wire as the conductor, combined with some cable technology and new materials, which is an innovative application product for high current transmission and distribution. The product structure mainly consists of copper wire conductors, winding layers, insulation layers, metal armor layers, and sheath layers. Corresponding functional materials are used according to different usage scenarios. The rated current range of high current flexible busbar is 200-6300A canbe used in seven fields, including new energy, power system, industrial and commercial buildings, IDC room, rail transit, metallurgy and chemical industry, and ships.



Features

1.safe & reliable

Combine partial cable manufacturing technology and original fine craftsmanship.

Integrate machine assembly lines for standardized production.

A comprehensive testing system and strict quality control.

Real time online monitoring of flexible busbar current，voltage，temperature，etc .

2.convenient & efficient

Compact structure with small volume, easy to store and transport.

Flexible and lightweight, easy to construct, lay and install.

Integrated long-distance laying without the need for multiple accessories.

Suitable for various space sizes，and high flexibility in renovation.

3.better performance

High protection level, moisture-proof, water-resistant, and high- temperature resistant, suitable for outdoor and humid environments.

No eddy currents, good heat dissipation performance, lowtemperature rise, high current carrying capacity, low line loss, and high electrical efficiency.

The surface insulation and protective materials are fully covered, and the outer sheath has no induced electricity, with good safety performance.

4.higher cost performance

Within equal current carrying capacity, Copper wire conductors have high current density, and low material cost.

Less accessories,lower cost.

Low construction difficulty, short construction period, and low construction cost.

Low failure rate and low maintenance cost.

Caregory

TMR：flexible busbar V：PVC insulation S：Aluminum alloy armor T：Copper alloy armor V：PVC sheath Y：Polyolefins

产品类型	型号	产品特性	应用场景
General	TMRVV	Without metal armor,waterproof , wear-resistant	Indoor
	TMRVSV	With metal armor, waterproof, wear-resistant properties,strong resistance to external pressure.。	Outdoor
Flame-retardant	Z（A、B、C）-TMRVV	Use flame retardant materials. In a fire environment, prevent and prolong the combustion and spread of fire along cables.	In densely populated public places such as high-rise buildings, shopping malls, schools, subway stations, airports, sports stadiums, exhibition halls, hospitals, etc..
	Z（A、B、C）-TMRYY		
	Z（A、B、C）-TMRYSY		
Fire-resistant	Z（A、B、C）N-TMRVV	Use fire-resistant and high-temperature resistant materials. In a fire environment, ensure normal and stable power supply for a certain period of time.	
	Z（A、B、C）N-TMRYY		
	Z（A、B、C）N-TMRYSY		
Low smoke & halogen-free	WDZ(A、B、C)-TMRYY	The material does not contain halogens, and the corrosiveness of combustion products is low. It is produced during combustion.There is less smoke and dust, higher light transmittance, and the ability to prevent or delay flame spread/ the intergrity of the circuit be maintained.	
	WDZ(A、B、C)N-TMRYY		
	B1(d0、t0、a1）-WDZ(A、B、C）-TMRYY	In addition to the characteristics of products in the same series, this model of product has passed the GB/T31247-2014 standard test and has higher quality.	

**Note: The above types are all environmentally friendly series products, and the naming rules refer to GD DBJ/T15-226-2021 "Technical Regulations for Fire Protection of Civil Building Wire and Cable".*

Accessories

Converse Case

Mainly used for branching flexible busbars, to tap or transfer flexible busbars to expand their application range.

Connector

The flexible busbar adopts a single circuit main line integrated laying without additional joints in the middle of the main line. To branch the electrical load from the main line, T-shaped joints or customized joints can be used.

Selection and Parameters

AT（A）	Flexible busbar （A）	Bending radius （mm）
160	200	⩾200
200–300	300	⩾200
315–400	400	⩾200
500	500	⩾200
630	630	⩾200
800	800	⩾500
1000	1000	⩾500
1250	1250	⩾500
1600	1600	⩾500
2000	2000	⩾1000
2500	2500	⩾1000
3200	3200	⩾1000
4000	4000	⩾1000
5000	5000	⩾1000
6300	6300	⩾1000

- Rated current：200–6300A
- Rated voltage：⩽3kV
- Rated frequency：50Hz
- Product type：IP68
- Max. operating temperature：105℃

- Cores（P）

4	A,B,C,N equal cross-section
5	A,B,C,N,PE equal cros-section
3+1	A,B,C equal cross section, N 50% cross section（without PE）
3+2	A,B,C equal cross section, N and PE 50% cross section
4+1	A,B,C,N equal cross section, PE 50% cross section

Parameters

Rated capacity (A)	Resistence (R*10^-6Ω/m)	Impedance (Z*10^-6Ω/m)	Voltage Drop (V/m)	Short- circuit strength KA(Max.) (t=1s)	Current (TMRVV AC below 3kV, TMRYV DC below 1.5kV,in air at room temperature of 35℃)	
					TMRVV(AC)	TMRYV(DC)
200	94.4	103.8	0.0475	35	220	225
300	89.5	85.3	0.0455	40	325	330
400	70.8	83.2	0.041	50	430	440
500	71.5	82.7	0.04	58	525	535
630	73	72.4	0.038	65	645	675
800	61.4	69.8	0.036	70	815	880
1000	46.6	53.8	0.032	85	1050	1090
1250	28.9	40.6	0.03	100	1275	1465
1600	23.6	38	0.028	115	1630	2035
2000	21.3	24.1	0.026	129	2065	2685
2500	14.4	19.7	0.024	135	2560	—
3200	11.9	16.2	0.021	150	3255	—
4000	10.8	12.6	0.019	165	4040	—
5000	7.5	10.3	0.017	175	5070	—
6300	5.95	7.8	0.0145	190	6340	—

Laying method and current carrying capacity correction factor

Changes in environmental temperature coefficient during bridge laying, pipe laying, and direct burial laying

Ambient Tempreture (℃)	10	15	20			25			30			35			40		50		60		70	90
Busbar working temperature (℃)	Direct Burail	Direct Burail	Bridge	Pipe	Direct Burail	Bridge	Pipe	Direct Burail	Bridge	Pipe	Direct Burail	Bridge	Pipe	Direct Burail	Bridge	Pipe	Bridge	Pipe	Bridge	Pipe	Bridge	Bridge
60	1.2	1.13	1.36	1.41	1.07	1.25	1.32	1	1.12	1.22	0.93	1	1.1	0.85	0.97	1	0.89	0.93	0.78	0.81	0.73	0.69
70	1.17	1.12	1.31	1.34	1.06	1.2	1.26	1	1.1	1.18	0.93	1	1.08	0.84	0.96	1	0.86	0.92	0.75	0.78	0.71	0.66
80	1.15	1.11	1.26	1.29	1.05	1.17	1.22	1	1.09	1.15	0.95	1	1.07	0.83	0.95	1	0.83	0.92	0.74	0.77	0.69	0.65
90	1.13	1.09	1.2	1.22	1.04	1.12	1.17	1	1.07	1.11	0.95	1	1.05	0.82	0.94	1	0.79	0.9	0.73	0.75	0.67	0.63
105	1.12	1.08	1.1	1.15	1.04	1.08	1.13	1	1.05	1.08	0.94	1	1.03	0.82	0.93	1	0.77	0.89	0.71	0.73	0.65	0.6

Note: 1. Suggested material for conduit type: PVC、 Coated steel pipes, MPP power pipes;

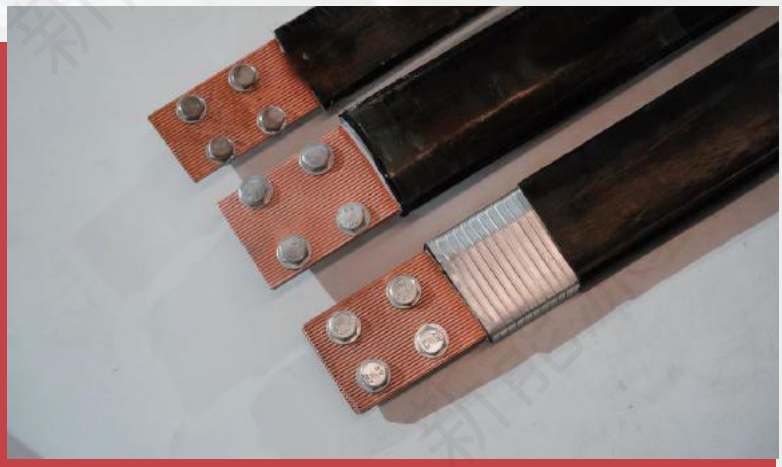
2. The diameter of the conduit is 2.5 times the width of the flexible busbar.

Perfomance Contrast

	Flexible busbar	Multiple runs of cable(triphase
Performance	Good resistance consistency and low heat generation.	Each resistor has a different value, resulting in differences in current flow and making it prone to heating.
Install	Small size, compact structure, easy installation; Specialized T - connector with high safety factor.	Multi splicing has a large volume and weight, and the joints are difficult to handle, which poses certain safety hazards.
Capacity	The product has a current carrying capacity of 200 - 6300A and does not require derating.	A single unit has a small current carrying capacity and requires multiple splicing and capacity reduction for use.
overall cost	High current density, significant copper savings, and higher cost - effectiveness.	Low current density, more copper is used, and the cost - effectiveness is lower.

	Flexible busbar	Comparct Busbar
Shape	Neat,tight and clear.	It takes up a lot of installation space.
Capacity	When the temperature rises by 135K and the surrounding environment temperature is 40 ℃, the overload capacity can withstand more than 33%.	When the temperature rises by 70K and the surrounding environment temperature is 30 ℃, the overload capacity can withstand 15%.
Install	The on - site assembly of flexible busbar is easy to construct, easy to install and disassemble, and can be rearranged as needed. The branch circuit can be modified without affecting the overall power supply when the main circuit is live.	Need to assemble in factory in advance, and the construction difficulty is high. If there is design change happens on site, products need to be returned to the factory.Low reuse rate, unable to carry out live branch operations.
Emergency management	Emergency backup can be used in case of system failure, utilizing the backup circuit conversion box can quickly restore power supply and improve system power supply stability.	Due to an accident requiring power outage for maintenance, it is impossible to restore power supply in a timely manner
Line loss	Low temperature rise, low energy consumption, energy - saving, and the larger the current specification, the more superior its energy consumption value is displayed.	Poor heat dissipation, high line loss, and energy consumption exceeding 20%.

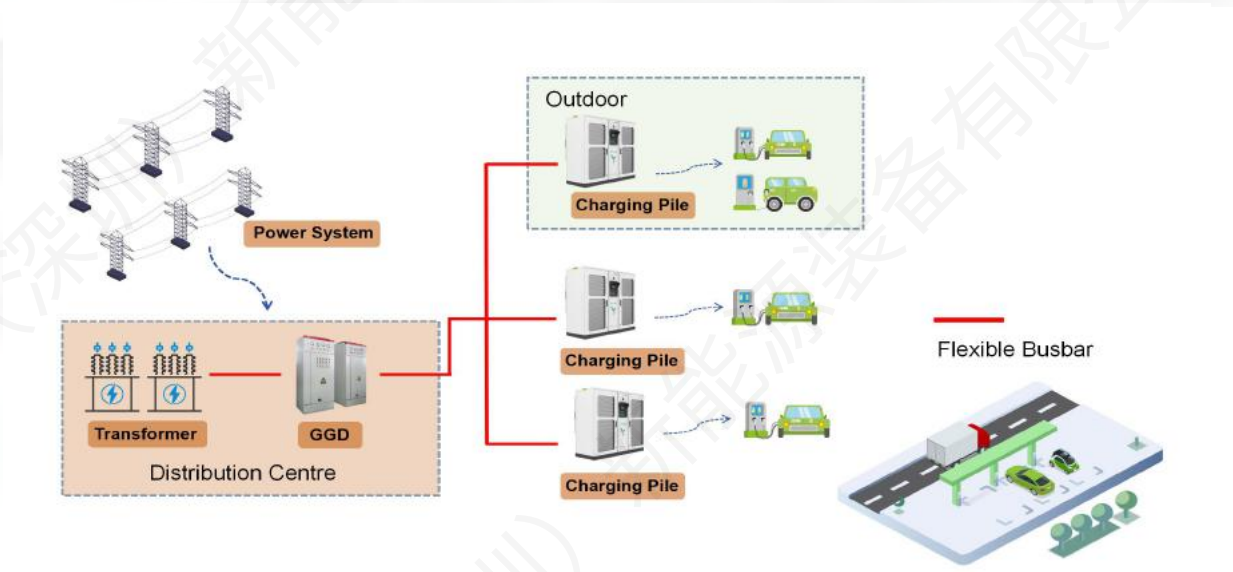
HIGH CURRENT
FLEXIBLE BUS 200-6300A



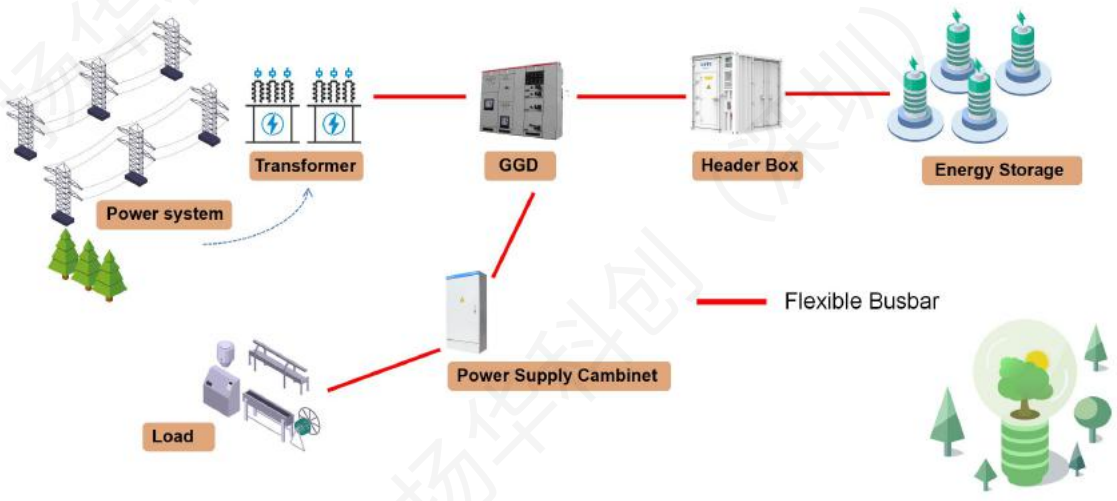
Full-scene solution provider of high current flexible busbar

SOLUTION

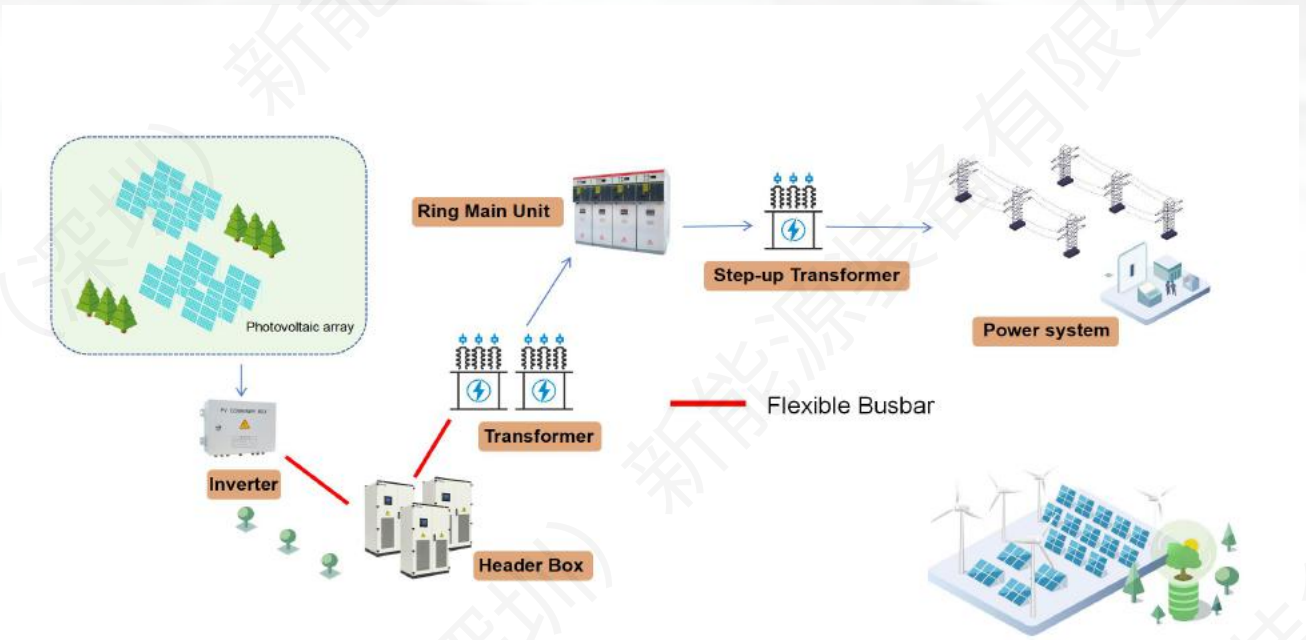
Super charge station



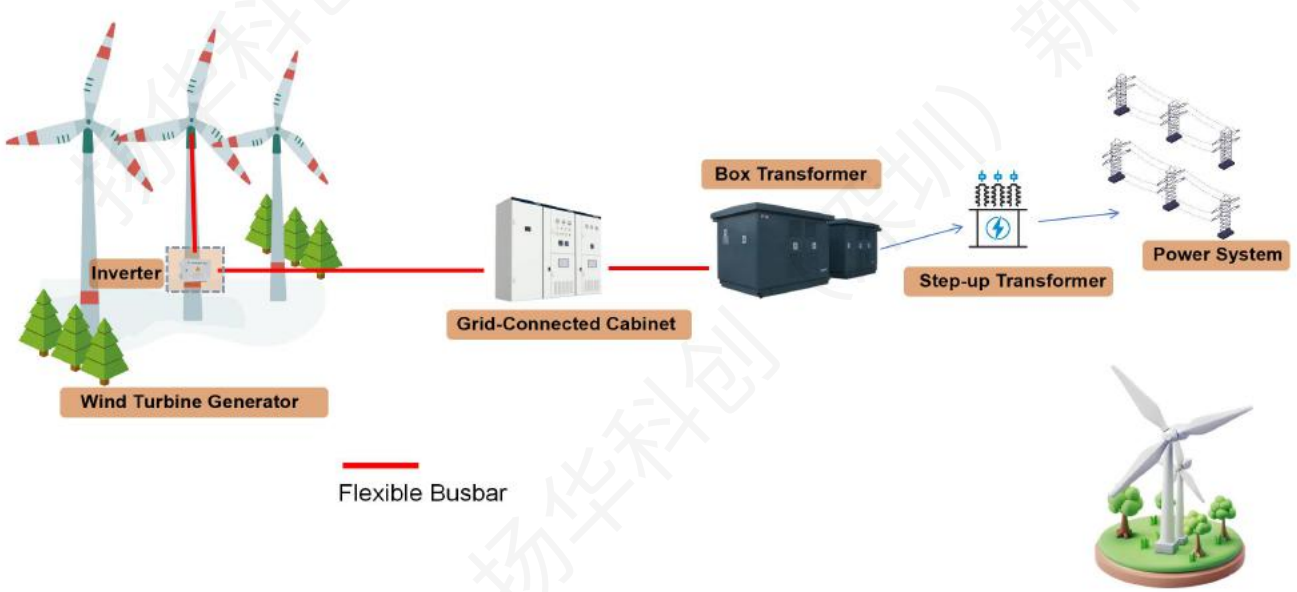
Energy Storage



Photovoltaic

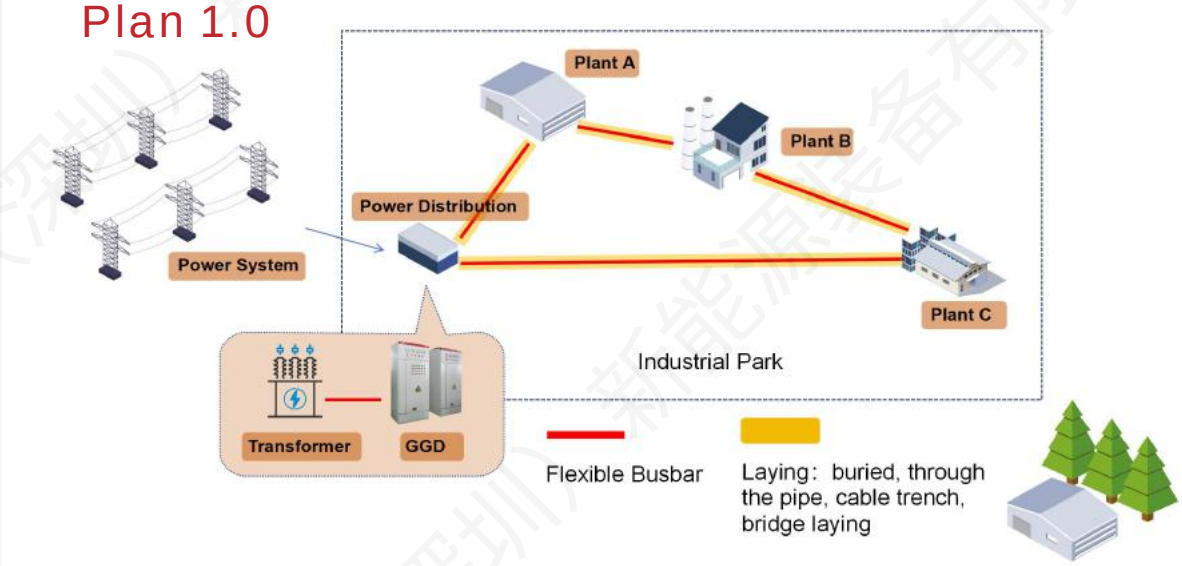


Wind power generation

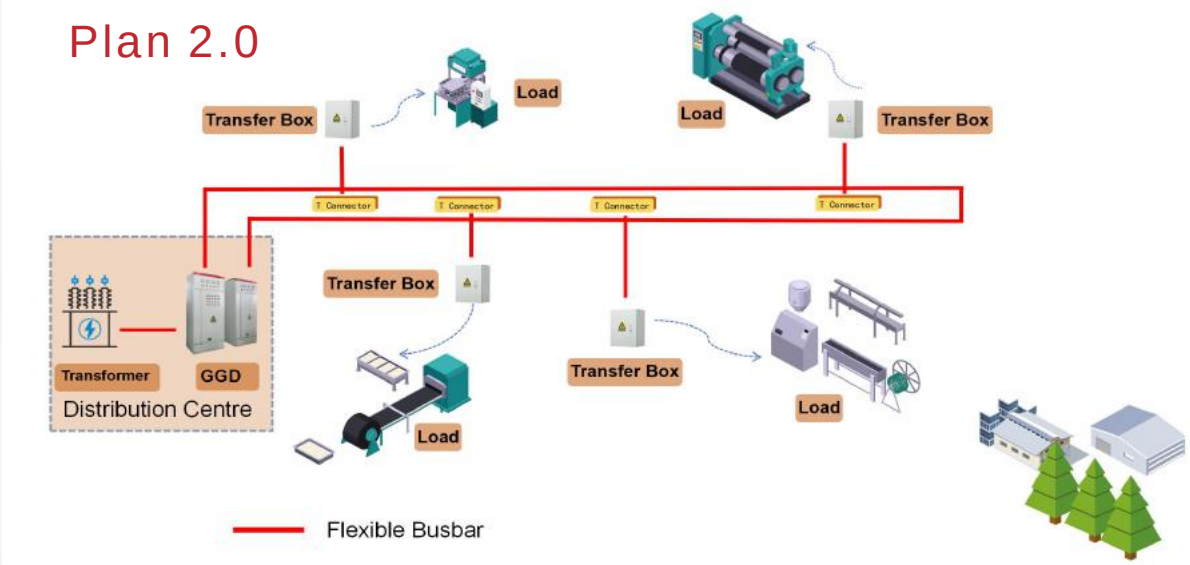


Industry Plant

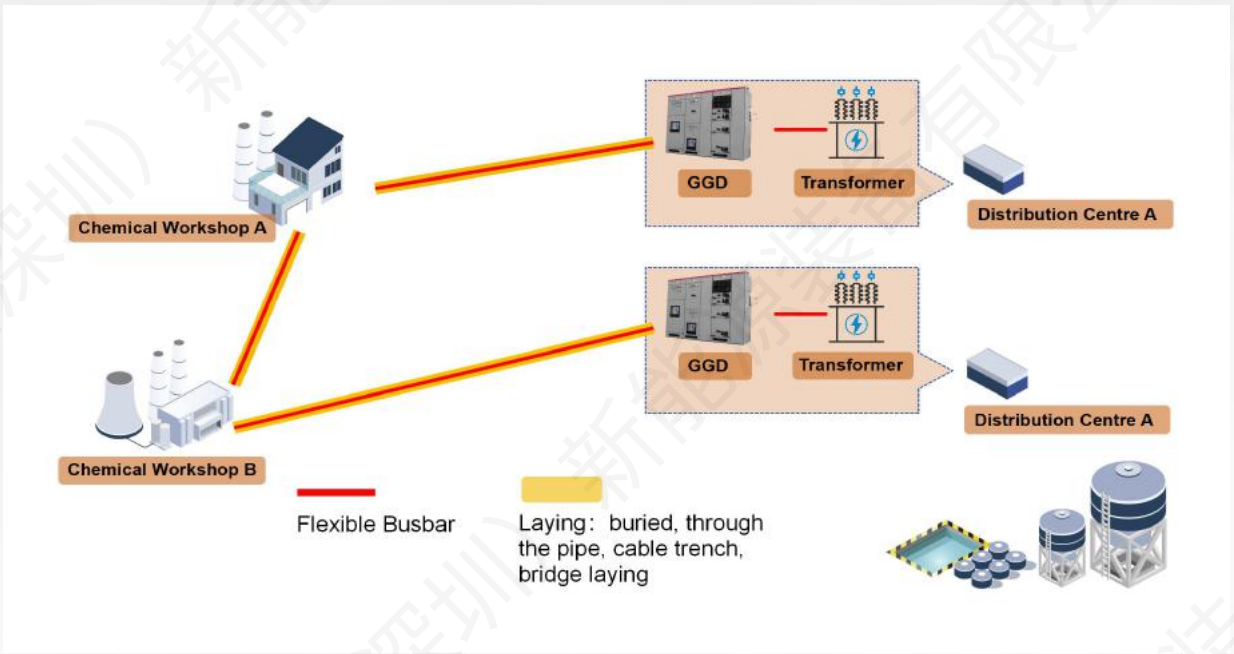
Plan 1.0



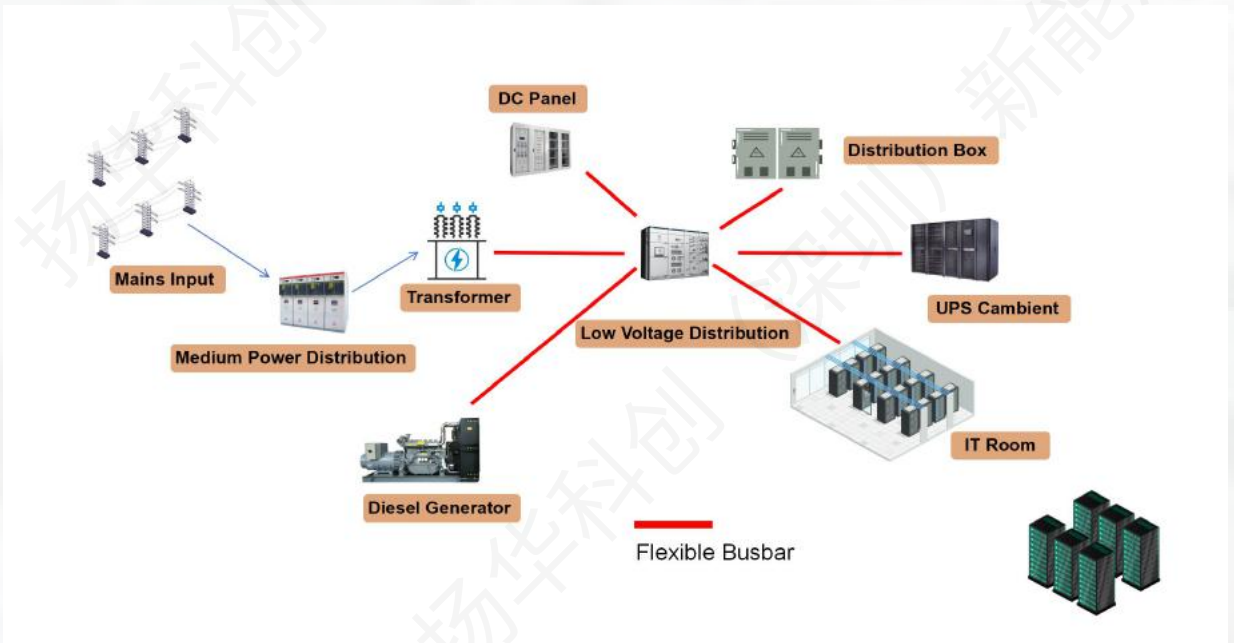
Plan 2.0



Chemical Industry



IDC data centre



PROJECTS

Huawei superchage station

CATL planet

Penghui energy storage

Midea planet

BTR New Materail Group planet

Hebei Commercial Complex

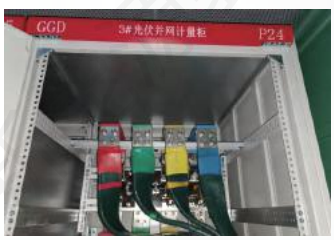
Guizhou Renhuai hospital

Aofeng new storage

Integrated highway
charging and storage

Changsha
China telecom building

24RECHARGING



shige photovoltaic

Planet in SA

Aopute Planet

Rooftop photovoltaics
in Hunan

Rooftop photovoltaics
in Guangdong

APPLICATION INDUSTRY

PARTIAL PARTNERS

HUAWEI · BYD · CATL 宁德时代 · Midea美的 · BTR 贝特瑞 · 鹏辉 GREAT POWER
国家电网有限公司 STATE GRID · 中国南方电网 CHINA SOUTHERN POWER GRID · 吉林建工集团有限公司 · 中国中铁股份有限公司 · 深圳地铁 SHENZHEN METRO
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HIGH CURRENT FLEXIBLE BUS

Safe&Relaible

Convenient&Efficient

Better Performance

Higher Cost performance

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扬华科创（深圳）新能源装备有限公司
YANGHUA STI（SHENZHEN）NEW ENERGY EQUIPMENT CO.,LTD

公众号　　视频号　　客服微信

全国统一咨询热线：400-883-1383