

# **Digital Transformation for Net Zero in China**

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# ■ contents

1

**Global  
Background**

2

**Study and  
Practice of  
Sustainable  
Digitalization  
in China**

3

**Future  
Development  
in China**

# The Hot Issue: Global Climate Change



On October 8<sup>th</sup>, 2018, the declaration from the **Intergovernmental Panel on Climate Change (IPCC)** mentioned that we should try everything on limiting range of average global warming into 1.5°C compared with temperature before industrialization and reducing the possibility of predictable catastrophe due to climate change.

Experts: We should take action on halving volume of CO<sub>2</sub> emission by around 2030 and reaching zero CO<sub>2</sub> emissions by around mid 21<sup>st</sup> century.

**Net Zero:** resulting in neither a surplus nor a deficit of something specified when gains and losses are added together.



Net Zero in 2050



Net Zero in 2050



Net Zero in 2050



Net Zero in 2050



Net Zero in 2045



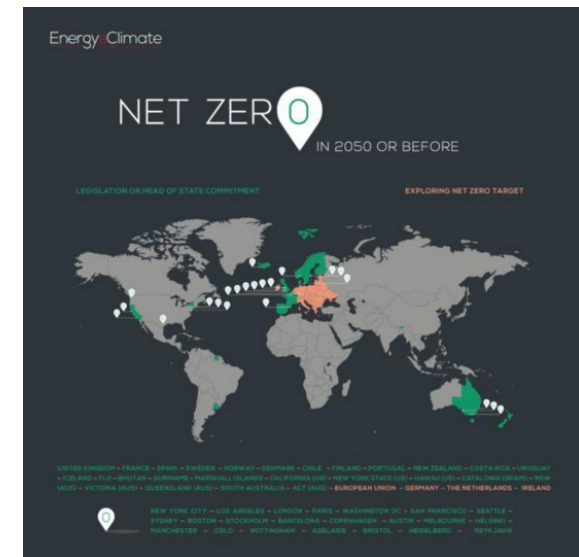
Net Zero in 2050



Net Zero in 2045



Net Zero in 2050



# Regulative Evolution for Net Zero in China

## 18<sup>th</sup> CPC National Congress

- Development of ecological civilization;
- Green, recyclable and low-carbon development in China.

## 19<sup>th</sup> CPC National Congress

- Establish and perfect economic system with green and low-carbon

Low-carbon  
Development

## China's Intended Nationally Determined Contribution: Enhanced Actions on Climate Change

- Reach to peak volume of carbon emission in 2030;
- The carbon emission per capital GDP reduced by 60%~65% compared with that in 2005.

Reach to Peak Volume  
of Carbon Emission

## The 13th Five-Year Plan for Economic and Social Development of the People's Republic of China

- Spread out the experimental low-carbon emission projects in large scale;
- Promote working on zero CO<sub>2</sub> emission;
- Make 50 Net Zero projects in 2020.

Nearly Zero  
CO<sub>2</sub> Emission

## 75<sup>th</sup> General Debate of the United Nations General Assembly

- China will achieve carbon neutrality before 2060.

## 2020 Climate Ambition Summit

- China will bring its total installed capacity of wind and solar power to over 1.2 billion kilowatts;

## 2021 China's Central Economic Work Conference

- “Strive to peak its carbon dioxide emissions and to achieve carbon neutrality” be the focused work in 2021.

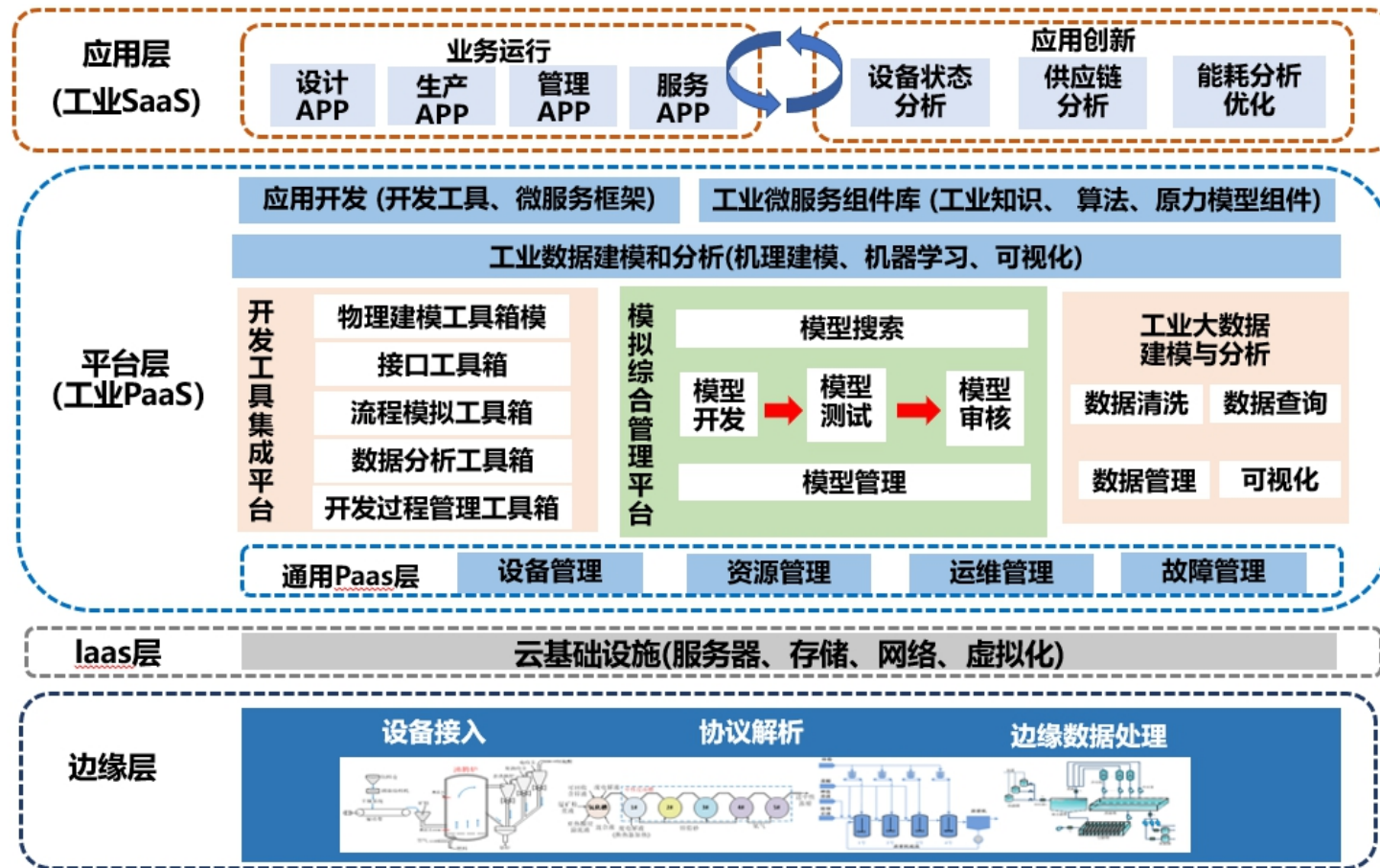
Carbon  
Neutrality

Zero CO<sub>2</sub>  
Emission



# Sustainable Digitalization Transformation in Industry

**Industrial Internet** is the infrastructure to realize intelligent manufacturing. It is an integrated platform for the interconnection of production factors and efficient business collaboration. It fully integrates industrial mechanism, industrial data and artificial intelligence analysis methods. It can efficiently share various industrial elements, support the transformation of manufacturing industry from local extensive to global fine, and realize green, safe and efficient manufacturing.



# Sustainable Digitalization Transformation in Industry

01

## For Manufacturing Devices

**Technology: Expert System(AI), Big Data**

Promote manufacturing workload and quality with fixed working power of devices.

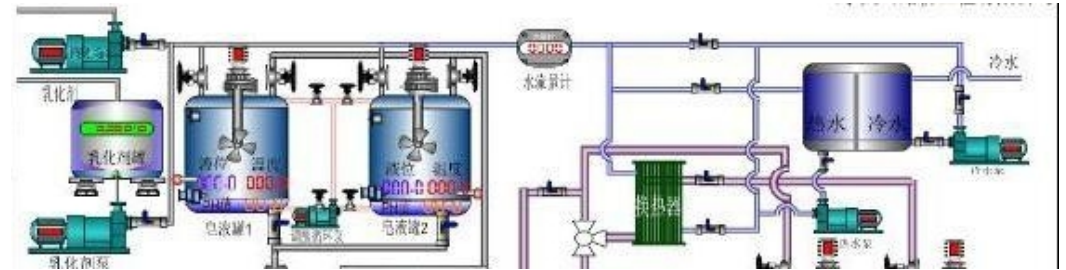


02

## For Manufacturing Process

**Technology: Deep Learning, Modulation**

Continuously optimize technological process;  
Reduce redundant working procedure;  
Promote working efficiency.



03

## For Management

**Technology: 5G network and AI**

Make comprehensive management for whole working process in manufacturing;  
Reduce redundant power consumption manipulated by human operation.



04

## For Recycle and Reuse

**Technology: Machine Vision**

Making refined recycle and reuse for raw material to decrease cost while promote utility efficiency.





# Sustainable Digitalization Transformation in Industry

01



Steel

- 01/2021-05/2021:  
Save 3 million kilowatts on electricity;
- Monthly save 100 thousand m3 gas.

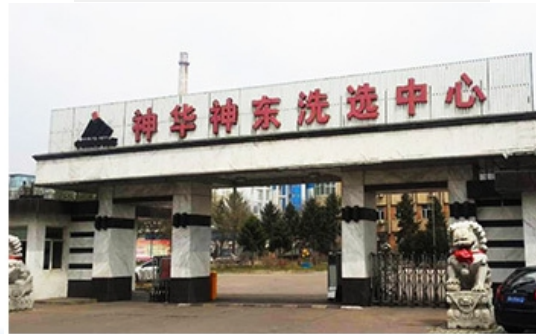


02



Coal

- Recycle 3 million tons more coal per year;
- Absorb more than 500 thousand CO2 emission per year.



03



Gas

- Achieve water recycle in 82%;
- Save 1.2 million tons of coal per year.



04

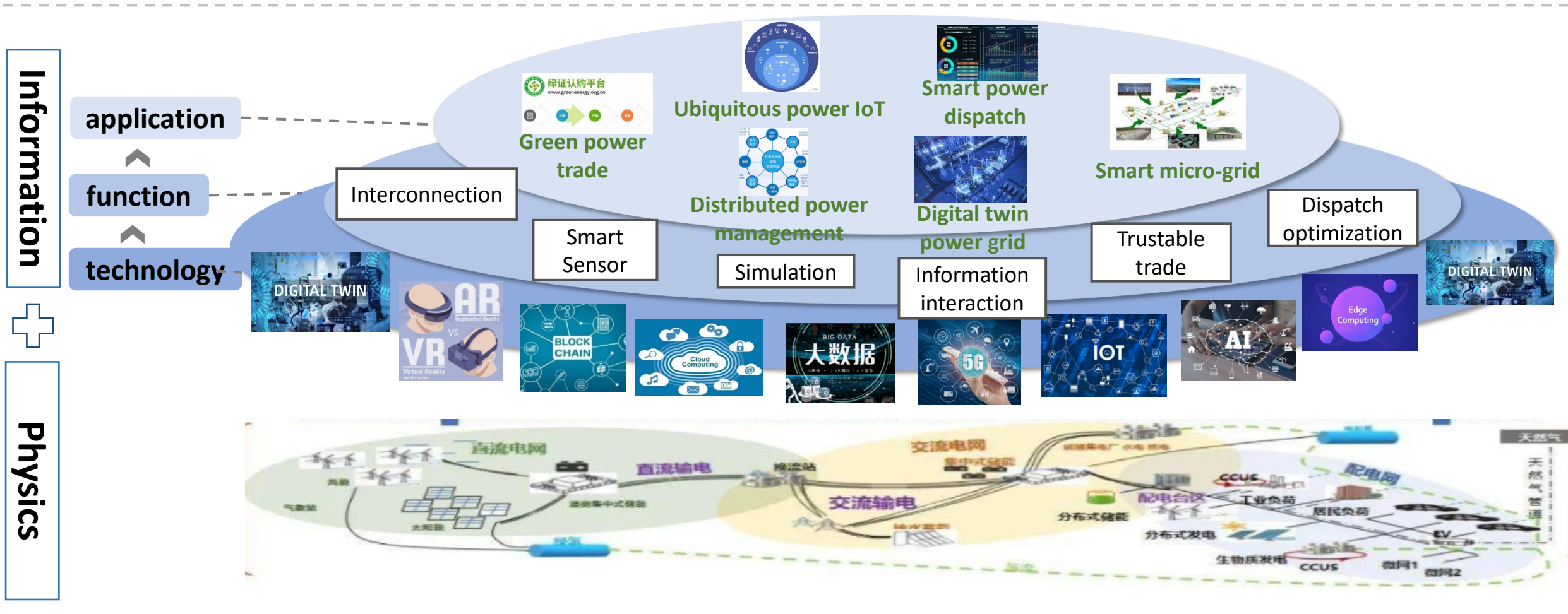


Cement

- Decreased 1.05 million tons of CO2 emission;
- Decreased power consumption by 1.6%.



# Sustainable Digitalization Transformation in Power



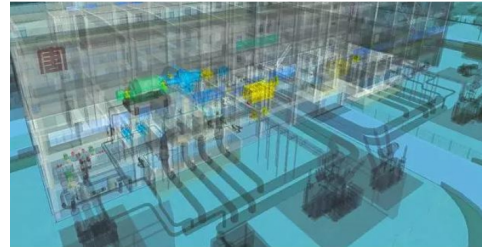


# Sustainable Digitalization Transformation in Power

**TBEA**  
特变电工



The photovoltaic power station e-cloud intelligent operation and maintenance platform from TBEA, making power station operation and maintenance efficiency is improved by 10%, power generation is increased by 2%, and kwh cost is reduced by 4%.



Datang Taizhou Thermal Power Co., Ltd. built a smart power plant, with an annual reduction of 9.3% in gas consumption and 0.96% in auxiliary power consumption.



Xiongan New Area Urban Smart Energy Management and control platform help reduce the energy consumption cost by about 10%.

POWER+能源共享平台

POWER+基于能源物联网技术,融合边缘计算、机器学习、移动互联、精益生产等先进技术和管理经验,打造信息驱动智慧运营管理平台,针对发电、储能、工商业配电网及综合能源领域的运营商、设备商、服务商等不同的客户特点,提供面向集团、区域、电站等多角度的个性化服务。

- 运营中心**  
精细化运营管理,提升工作效率  
设备健康管理,提升设备运行效率
- 报表中心**  
快速生成报表,提升工作效率  
定制化数据报表,满足客户个性化需求
- 移动APP**  
远程移动办公,提升工作效率  
信息推送,突破空间管理限制
- 智能网关**  
兼容多种协议采集,支持多种设备接入  
主动异常数据识别,边缘计算实现数据质量控制
- 诊断中心**  
机器学习智能故障诊断,数据驱动电站管理  
设备性能可视化呈现,直接发现设备特性
- 数据洞察**  
高阶数据分析,数据驱动运营  
设备性能可视化呈现,直接发现设备特性
- 运行分析**  
可视化大数据分析,高度融合数据资源  
多维度系统分析,直观呈现运营数据

Xiehe New Energy Group Co., Ltd. released “power + cloud platform”



China Southern Power Grid will deeply integrate digital technology with physical power grid. It can promote the construction of digital scenes such as intelligent distribution room, intelligent microgrid, etc.



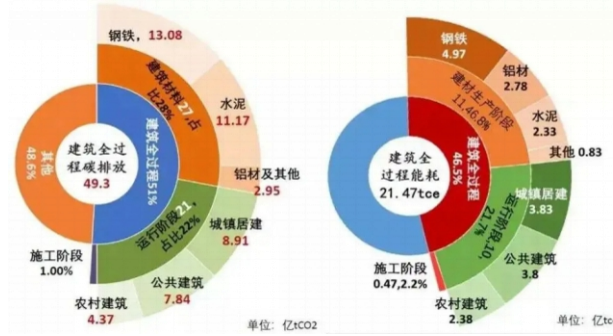
# Sustainable Digitalization Transformation in Building

## Energy Consumption Analysis during Construction and Operation of Buildings

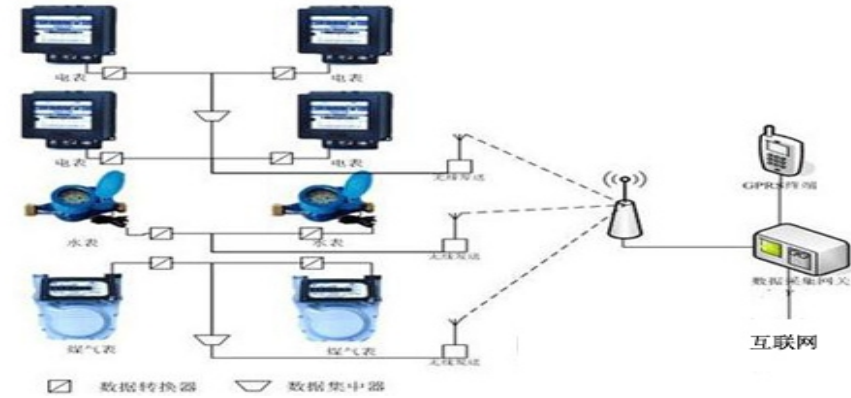


**内含碳排放**  
建筑在建设过程中钢铁、水泥、玻璃等建筑材料的生产和运输，以及现场施工过程中产生的碳排放

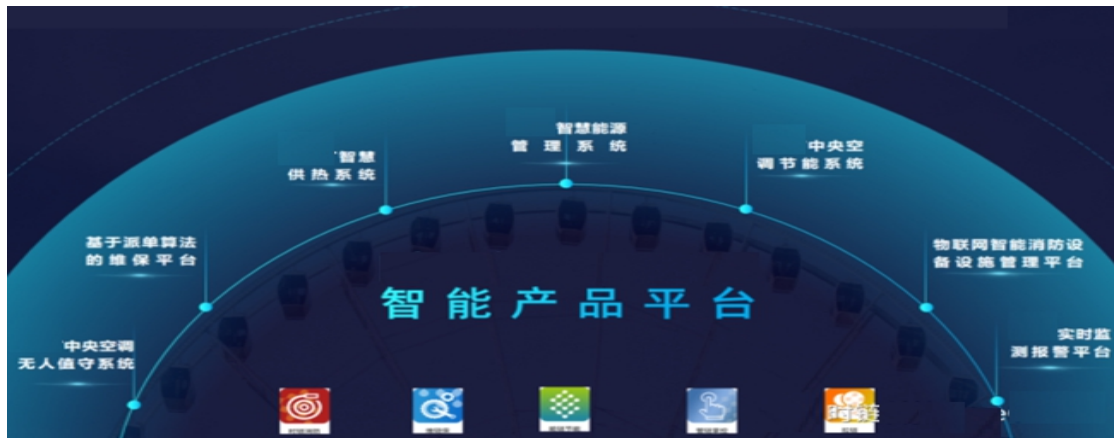
**运营碳排放**  
建筑在使用过程中产生的碳排放



## Energy Consumption Data Collection and Data Share on Management Platform



## Smart Management and Control System



## Interconnection between Buildings



# Sustainable Digitalization Transformation in Building

## Construction process: compared with traditional way



**Carbon emission reduction: 10% ~20%**

## Operation process: compared with traditional buildings

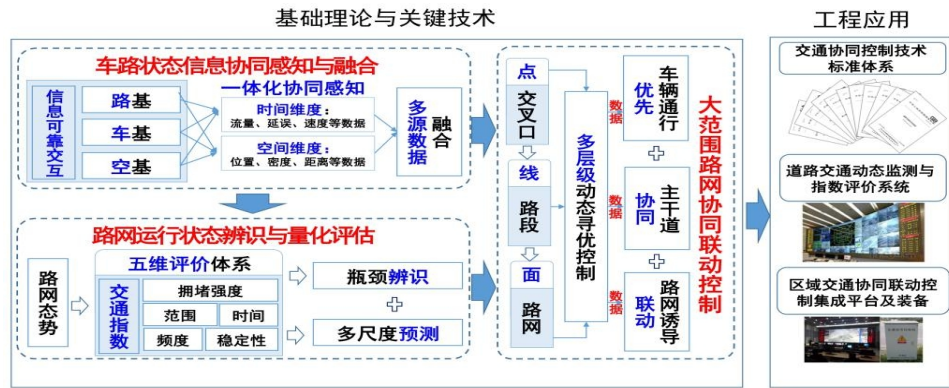
**Carbon emission reduction: more than 50%**



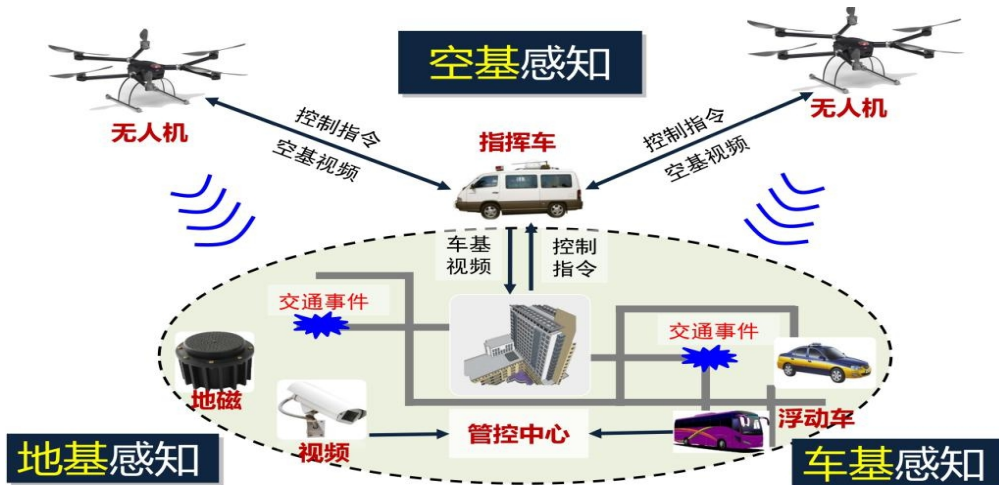


# Sustainable Digitalization Transformation in Traffic

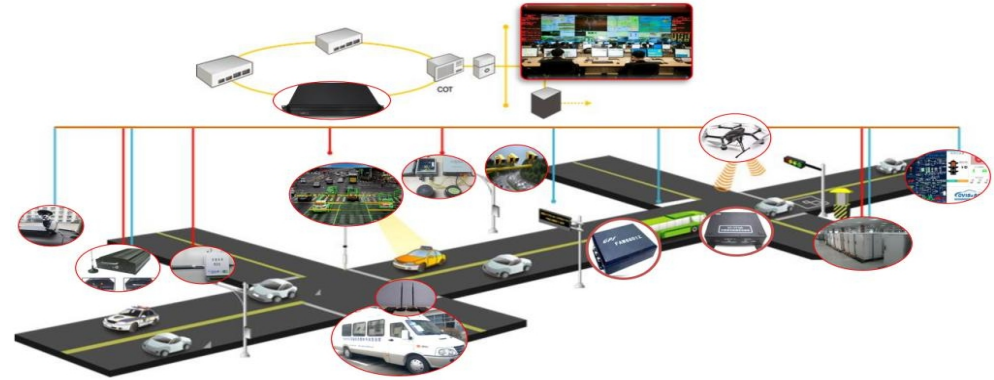
## Technical Structure of Smart Traffic System



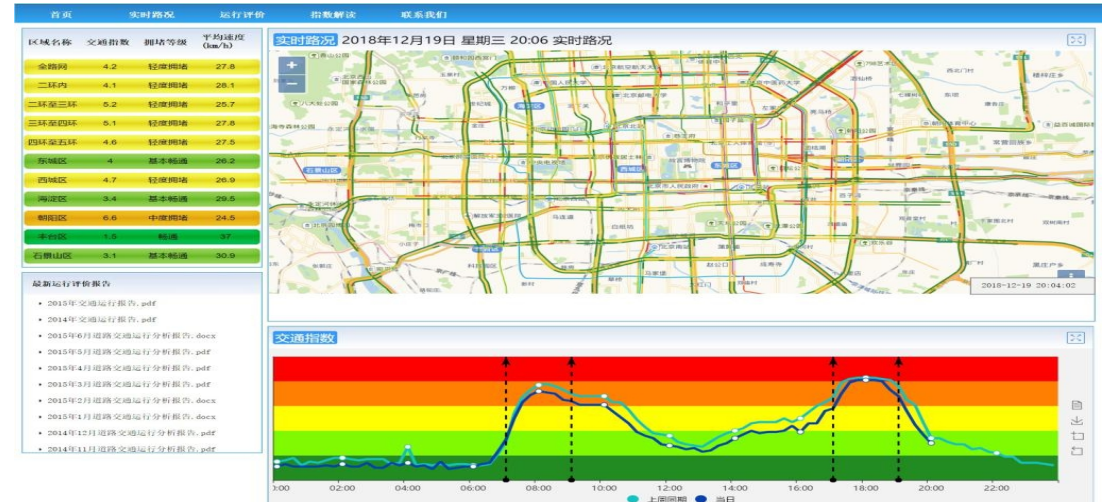
## Integrated Cooperation Model with Road, Air and Vehicle



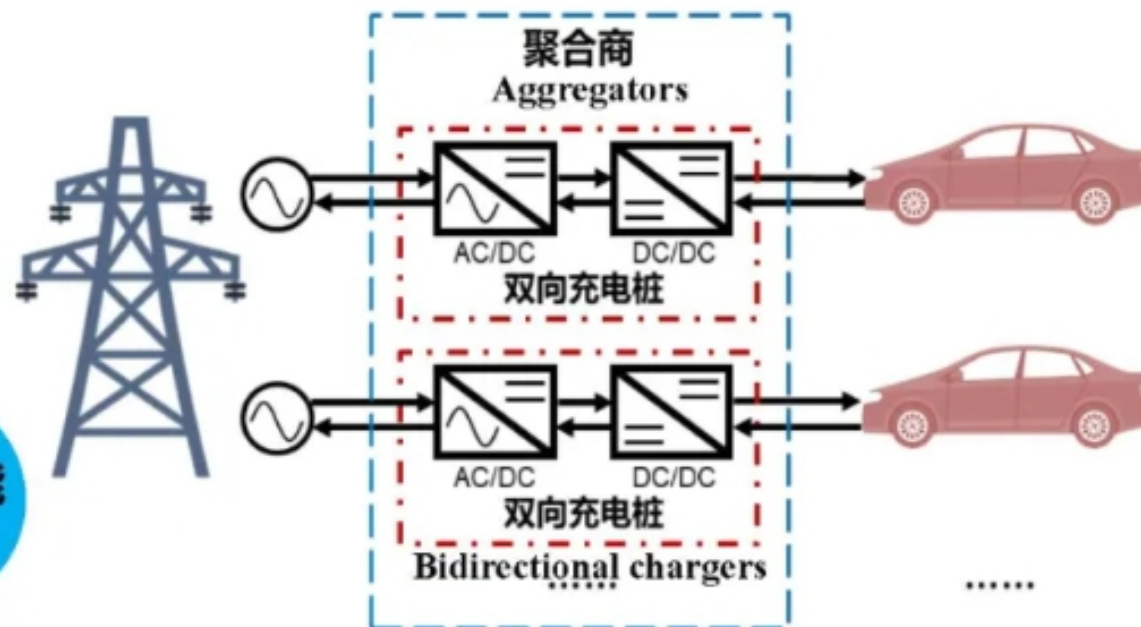
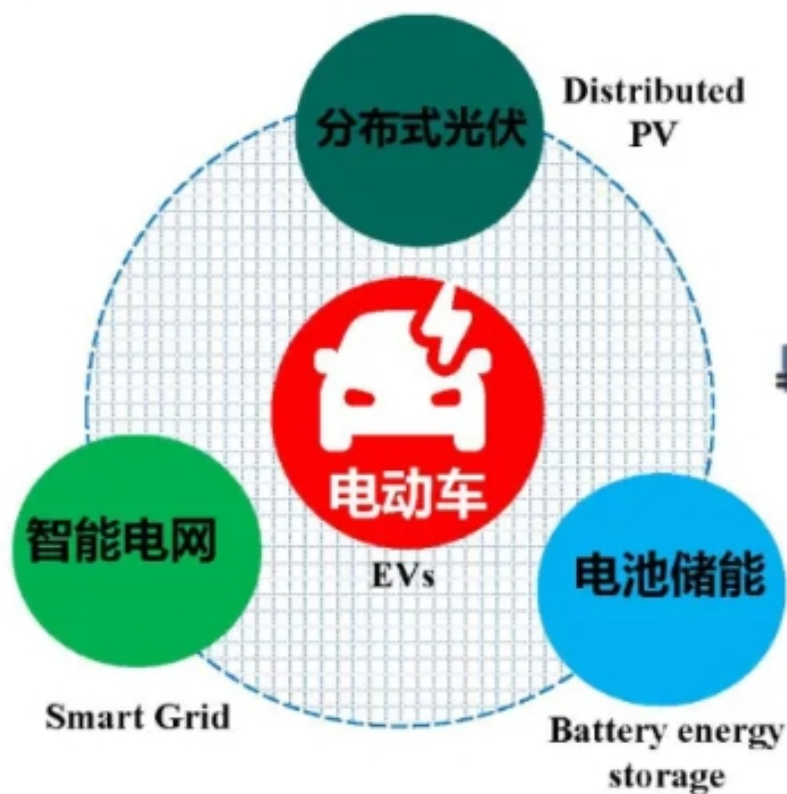
## Integrated Control Platform of Regional Synergy for Traffic System



## Dynamic Monitor for Traffic System



# Sustainable Digitalization Transformation in Traffic



## What should we do next?

01

Making technology study on new-generation ICT and deeply applying on different industries

02

Study and publish international, national and industrial standards

03

Making calculation system for GHG emissions

04

Establishing a symbolic net zero city, area, data center, base station etc

05

Continue international cooperation in sustainable and digitalization transition and achieving Net Zero goal.





**CAICT** 中国信通院

国家高端专业智库 行业创新发展平台  
National

**Thank You!**

