低碳製造，淨零轉型，永續發展

Low Carbon Solution for Sustainable Manufacturing

ALAN.CHOU｜Delta Electronics (Thailand)

Sep /12/2023

Content

1. Delta Group Introduction
2. Sustainability Development - ESG Trend
3. Delta Carbon Neural Solutions
   - Industrial Automation Solutions
   - Green and Smart Factory Management

Delta Group

Corporate Mission

To provide innovative, clean and energy-efficient solutions for a better tomorrow.

Brand Promise

Smarter. Greener. Together.

“Smarter"
is our continuous innovation in power electronics technology.

“Greener"
represents Delta's mission since our founding.

“Together“
is our business philosophy in building long-term partnerships with our stakeholders.

Business Categories

Power Electronics

Components

Power & System

Automotive Electronics

Fans & Thermal Management

Innergie

Automation

Industrial Automation

Building Automation

Infrastructure

ICT Infrastructure

Energy Infrastructure and Industrial Solutions

Display Solutions - Vivitek

Sustainability Development - ESG Trend

Top 10 Global Risks for the Decade Ahead

- The World Economic Forum (WEF) released a survey on global risks in 2022. For this survey, WEF gathered nearly 700 experts to study 30 risks and analyze the likelihood and impact of these risks.
- The global impact of climate change: extreme climate, water resource……

Source： The World Economic Forum (WEF) 2022

ESG Trend

Environmental

Focus on the company's environmental, ecological and climate-oriented treatment measures.

Common projects include:

- Carbon-neutral during production process
- Build Carbon Footprint
- Treatment of factory exhaust gas and waste water
- Switch to green energy for energy supply
- Improve energy efficiency

Carbon Neutral issues

Background of 2050 Net Zero Emissions and Current Situation

- The climate issue has aroused great international attention, and countries have successively put forward declarations and actions of "2050 net zero emissions". 137 countries responding to net-zero emissions by 2022.
- 16 countries have enacted legislation on net-zero carbon emissions. The European Union has planned to adopt the Carbon Border Adjustment Mechanism (CBAM) for imported products, which may impact the export industries of various countries.
- By clarifying national reduction targets and implementing a domestic carbon pricing system, it is beneficial to seek exemptions or offsets through trade negotiations. By 2022, 68 countries and regions will implement carbon pricing.

Chain reaction 1: Global supply chain

Most influential enterprises (Apple, Dell, Nike, P&G…) joined RE100. Related suppliers will be required to use 100% renewable energy.

Global enterprises
Apple committed to net-zero and RE100 by 2030.

Primary suppliers
TSMC: net-zero and RE100 by 2050

Secondary suppliers
To reduce energy usage 20% by 2030

Chain reaction 2: Government leads net-zero

State-owned enterprises start planning solutions for reducing energy usage to meet net-zero target.

Situations in Taiwan:

Iron & Steel

Emissions reduce
- 7% by 2025,
- 22% by 2030,
- net-zero by 2050

(comparing with 2017)

Petrochemical

Emissions reduce
- 30% by 2030,
- 57% by 2050

(comparing with 2005)

Electric power

To achieve net-zero with transformation, alternative energy, and carbon fixation

Net Zero policies from ASEAN country

The carbon reduction trend that has emerged since Europe and the United States has gradually fermented. Major Asian countries have successively proposed carbon reduction commitments. Southeast Asian countries have also begun to conduct policy research and plan carbon pricing mechanisms to promote low-carbon transformation of enterprises.

Country	Key Policy	Target	Carbon credit and tax
 Vietnam	Environmental Protection Law	Net zero - 2050	Carbon Trading – 2025 trial run and take effective officially from 2028
 Thailand	Climate Change Response Act	Carbon Neutral -2050 Net zero - 2060	2015-2020, V-ETS (Emissions Trading Scheme) 2023 – FTIX platform open for credit trading
 Indonesia	N/A	Net zero - 2060	Carbon tax: 2.1 USD tCO_2e for power plant from 2022 and will extend to other industry. Carbon trading - 2025
 Malaysia	Climate Change Response Act	Carbon Neutral -2050	Planning carbon trading and carbon tax
 Philippine	Climate Change Response Act	Carbon reduction 75% by 2030	Planning carbon trading and carbon tax
 Singapore	Long-Term Low-Emissions Development Strategy (LEDS)	Net zero - 2050	50-80 SGD / tCO_2e by 2030

資料來源：工研院產科國際所

Net Zero Emission

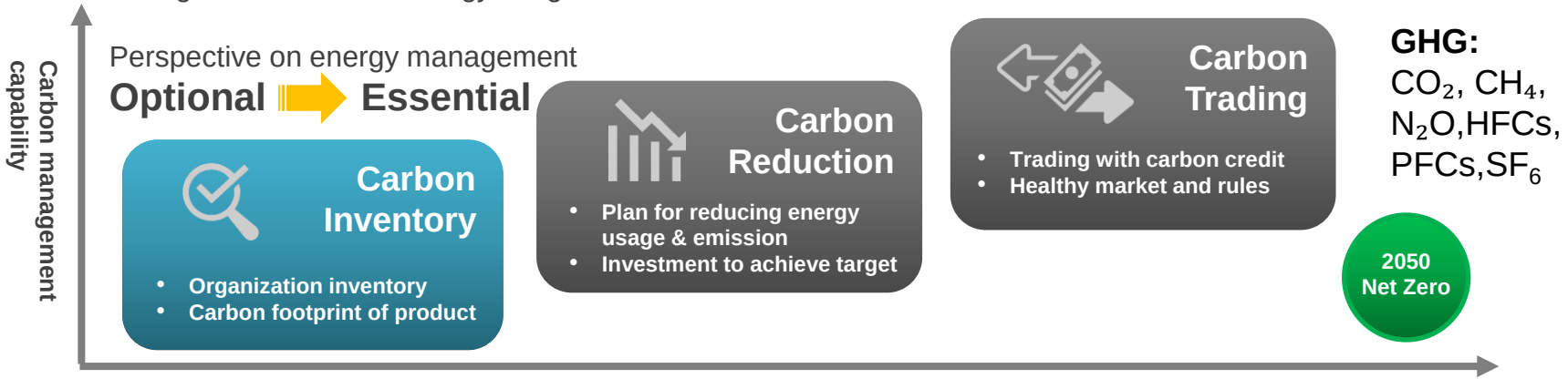
What is Net Zero Emissions?

NETs: Negative emission technologies
CCUS: Carbon Capture, Utilization and Storage

Minimizes greenhouse gases (GHG) emission then neutralizes it with technology and trade to achieve a balance in conclusion.

Process to Net Zero Emissions

73% global GHG from energy usage



Focused on Seven UN Sustainable Development Goals

Commitments to International Initiatives

WE MEAN BUSINESS COALITION | SCIENCE BASED TARGETS – DRIVING AMBITIOUS CORPORATE CLIMATE ACTION | TCFD – TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES | CLIMATE GROUP EV100 | RE100 CLIMATE GROUP | BUSINESS AMBITION FOR 1.5°C – SCIENCE BASED TARGETS – THE NET ZERO STANDARD

2015 Commitments for "We Mean Business"

- Science-based emissions reduction targets (SBT)
- Climate change information in main reports (TCFD)
- Responsible Corporate Engagement in Climate Policy

2017 Pass SBTi Evaluation

SBT target:

Reducing carbon intensity by 56.6% by 2025 with 2014 as the base year

- The 1st in Taiwan and the 87th in the world to pass the evaluation

2018 Commit to EV100

Scope:

Delta's major operation sites

Commitment:

- Expansion of EV charging facilities
- Switch to using EVs for company vehicles by 2030
- Incentives for employees and customers to use EVs

2021 Commit to RE100

Use 100% renewable electricity in global operations by 2030

2022 Net-zero SBT Pass SBTi Evaluation

Achieve net zero emissions at all global operating sites by 2050

Signed the ZEV declaration during the COP27

Carbon Neutrality Achieve carbon neutrality by 2030

Race to Zero Sign Business Ambition for 1.5℃

DELTA

Delta Carbon Neutral Solutions

- Industrial Automation

  Product & Equipment Portfolio ● System Platform ● Energy Saving ● Smart Manufacturing

- Green and Smart Factory Management

Industrial Automation Product Portfolio

IIoT Structure

Data Analysis & Optimization

- IIoT Cloud-based Platform — DIACloud
- Big Data Analytics
- Artificial Intelligence (Edge / Cloud)
- Modeling & Simulation

Management

Industrial PC

- DIAMMP — Manufacturing Management Platform
- DIAMES — Manufacturing Execution System
- DIASPC — Statistical Process Control
- DIAEMS — Equipment Management System
- DIAWMS — Warehouse Management System
- DIAAMS — Alarm Management System
- DIARMS — Recipe Management System
- edgeMES — MES of Machine Maker
- VTScada / DIAView — Supervisory Control & Data Acquisition System (SCADA)
- DIALink — Equipment IoT Platform
- DIAEnergie — Industrial Energy Management System (IEMS)
- DIAEAP — Equipment Automation Program
- DIAMCS — Material Control System
- DIASECS Family — SEMI Equipment Communications Standard
- DIAeBox — Smart Injection Molding Platform

Networking

- IIoT Industrial Cloud Router
- Industrial Ethernet Solution
- Fieldbus Solution

Control

DIAStudio Integration Software

- HMI
- PLC
- Motion Control
  - PLC-Based Motion Controller
  - CAD / CAM Computer-Aided Design / Manufacturing
    - PC-Based Motion Controller
    - Motion Control Card
    - CNC Controller
- Robot Controller
- Machine Vision System
- Temperature Controller

Drive Motor Actuator Sensor

- AC Motor Drive
- Power Quality
- Servo System
  - AC Servo Drive & Motor
  - Planetary Gearbox
  - Linear Motion
- Sensing
  - Pressure Sensor
  - Optical Sensor
  - Motion Sensor
  - Vision Sensor
  - Meter
  - Power Supply
- Servo Screw Driver
- Robot

Industrial Automation Smart Equipment Portfolio

Electronics Assembly


Surface Mount Assembly


Component Insertion


Odd-form Assembly


Insertion


RTM Insertion


Conformal Coating
Glue Dispensing
Soldering


RTM
Glue Dispensing


PCB Router


Screw Driving


RTM
Screw Driving


Labeling


Appearance Inspection


Automation Platform


Motor Winding


Servo Press


Advanced Hot Bar Bonding


Customized Equipment

* RTM:
Rapidly
Transformable
Machine

Semiconductor


Wafer
Edge Grinding


Wafer
Edge Profile


Wafer
Sorter


Semiconductor &
Adv. Packaging

Passive Component


Power Inductor
Winding


Dual Wire
Winding


Substrate
Inspection


SMT Six-Side
Inspection


Tapping &
Labeling


Testing &
Packing

Green Smart Factory Solution

AI + FMCS

IT

OT

Data Visualization

Carbon Emission / Footprint Management Platform

Self-learning | Auto-update | Information Security | Data Backup | Remote Control

EMS DIAEnergie

Trend analysis, Energy efficiency stats, Report management, Energy consumption warning, KPI analysis

Smart Factory Monitoring

VTScada Software for Monitoring & Control

AI Feature

Monitoring of Aircon, Chiller, Ventilation, Sewage treatment, Water supply, Indoor air quality Systems

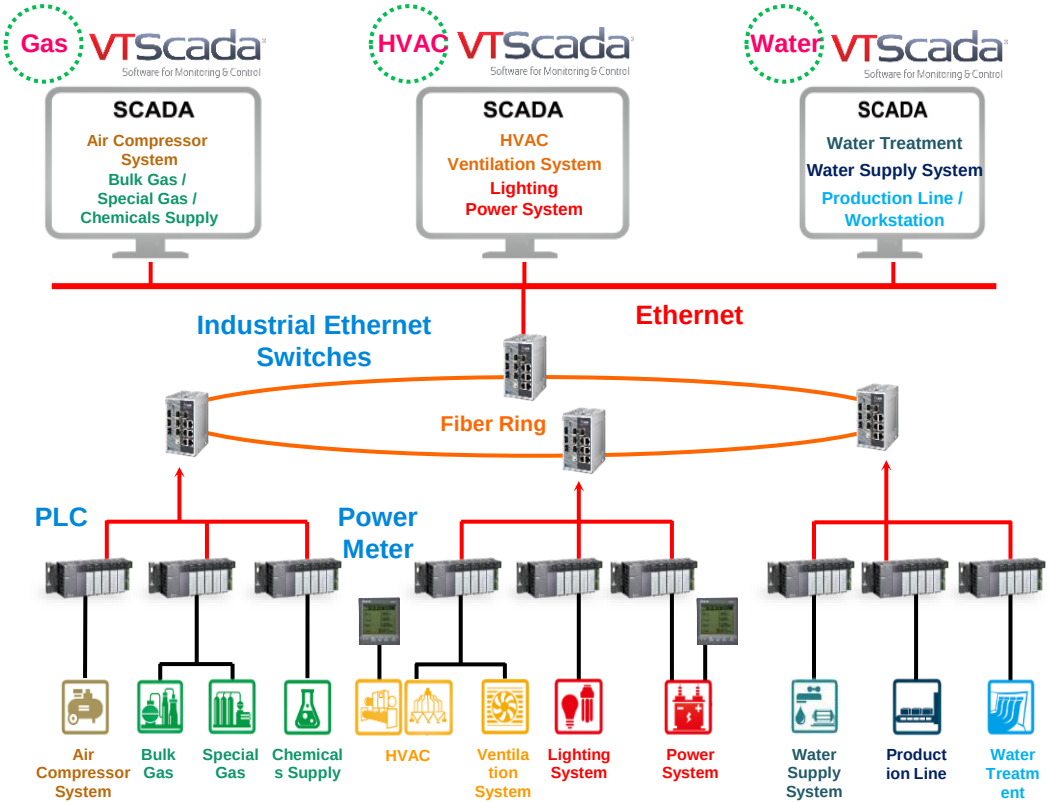
Solar Energy

Solar energy, Energy storage Systems

Interconnected Systems | **Energy-saving** | **Optimized Operations**

Energy Demanding Processes | **Energy Supply**

Facility Management & Control Systems (FMCS)



Issues / Needs

- Time and labor resources consuming for managing facilities on different sites
- Lack of instant problem warning and reactions
- History data collection and analysis for continuous manufacturing process improvement
- Avoids human negligence from data collections by manpower

Benefits

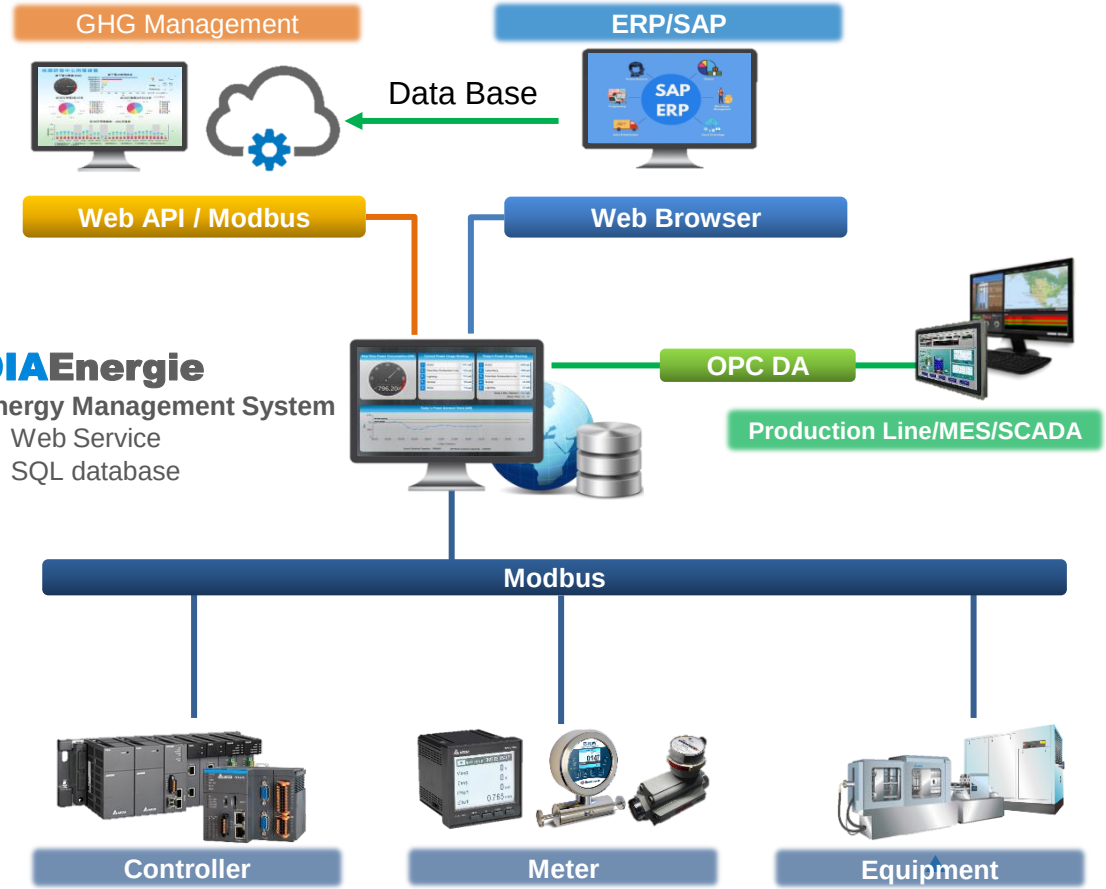
- Centralized control to save manpower , time and cost
- Distributed management for different subsystem s to increases system expansion flexibility
- Flexible group monitoring and controlling functions to enhance system redundancy capability
- Automated control and warning system to ensure stable operation and reduce human resources required

Energy and carbon Emission solutions

Get Information
- Energy visualization
- Notification (alarm / event)
- Regular report
- Carbon Inventory and footprint

Data Analysis
- Demand trend
- Energy usage structure
- Cost analysis
- Energy performance indicator
- Carbon emission

Following Action
- Demand control
- Improve correlated factors
- Energy saving review



Carbon Emission Categories

Carbon Emission Source

Category 1：Direct emission

Direct emissions & removals

- Stationary combustion
- Mobile combustion
- Processes
- Fugitive emissions

Category 2：Indirect emissions

Indirect emissions from imported energy

- Electricity consumption
- Energy excluding electricity (steam, heating, cooling, compressed air…)

Category 3~6：Indirect emissions (from other factors)

Transportation, business activity, product use, purchased goods, material, service…

Emission Calculation

GHG yearly emissions = **Activity data** x Emission factor x GWP

Activity data：resource purchase, usage, stock…
GWP: Global warming potential

DELTA system solutions

- Collects activity data in Category 1-6.
- Analyzes energy structure and equivalent carbon emission.
- Set up indicators to find out opportunities of carbon reduction

Carbon Inventory & Footprint

Inventory
- Organization

Collects carbon emissions caused by enterprise/factory operation

e.g. Yearly CO_2 emissions caused by the factory: 250 kt.

Requirement

- Complete & long-term emission analysis
- EMS for factory and building

Footprint
- Product

Calculates carbon emissions happen in product life span（**cradle to grave**）

e.g. CO_2 emissions in the whole process from material to EOL: 5 t /1000 pcs

Requirement

- Track & management of emission after the sale
- Value-added solutions going with product

Energy use takes a large part of carbon emission, this fact causes unprecedented opportunities for EMS solution.

Machine level

- Abnormal detection
- Data record
- CO2 calculation

DPM-DA530

Area/plant level

- Energy/Carbon visualization
- Reveal energy performance
- Environment information

DPM

DIAEnergie

Enterprise level

- Centralized host
- Energy/Carbon tracking
- Facility management & control

DPM

VTScada

DIAEnergie

Delta Energy Saving Consultant Service

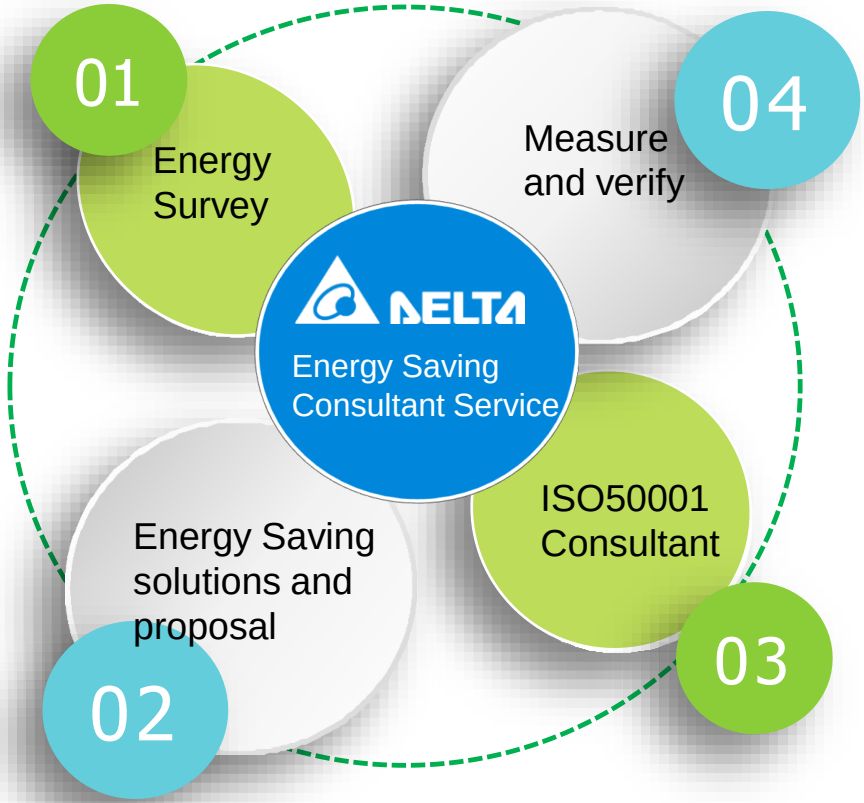
01

Program

- HVAC
- Lighting
- Electricity
- Socket
- Air Compressor
- Exhaust
- Heating recycling

02

- 自動故障檢測和診斷 (AFDD)



- HVAC
- Lighting
- Electricity
- Socket
- Air Compressor
- Exhaust
- Heating recycling

Assist to setup

- Energy baseline
- EnPI
- Energy team
- Energy management target
- Energy saving opportunity
- Regular review
- Continuous Improvement

Smart Green Factory

Green Factory + Smart Energy-saving Monitoring Solutions

Delta Electronics Thailand Plant 5 (HQ)

GOLD

LEED Certified Gold Green Building

Thailand's 1st Green Industrial Factory

Accumulated Energy Savings (2014-2022)

30,223,376 kWh

Accumulated Solar Power Generation (2016-2022)

24,360,700 kWh

Accumulated Water Savings (2014-2022)

134,589 m^3

Accumulated CO_2 Emission Reduction (2014-2022)

30,701 tCO_2e

Energy Savings for Customers

From 2010 to 2022, Delta's high-efficiency products and solutions helped customers

Electricity Consumption Savings of

39.9 B kWh

Carbon Emissions Reduction

21.05 M Tons

HVAC ● Air compressor ● LED Lighting ● Fan & Pump ● High efficiency motor ● Power quality ● Renewable Energy

Where You Can Find Us

www.deltathailand.com

You may scan my contact information into your address book