Technical Solution of Bystonic Machine Upgrade--6KW Fiber

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Industry Development Trend: Gas to Fiber

Fiber Laser Generator

replace

CO2 Laser Generator

- ✓ **High efficiency:** higher metal absorption rate, higher energy density, faster cutting efficiency.
- ✓ **Low cost:** use cost, repair and maintenance cost, spare parts cost are greatly reduced.
- ✓ **Simple Laser transmission:** flexible optical fiber replaces specular reflection, maintenance is simpler, and the equipment occupies a smaller area.

Fiber Era is Coming!

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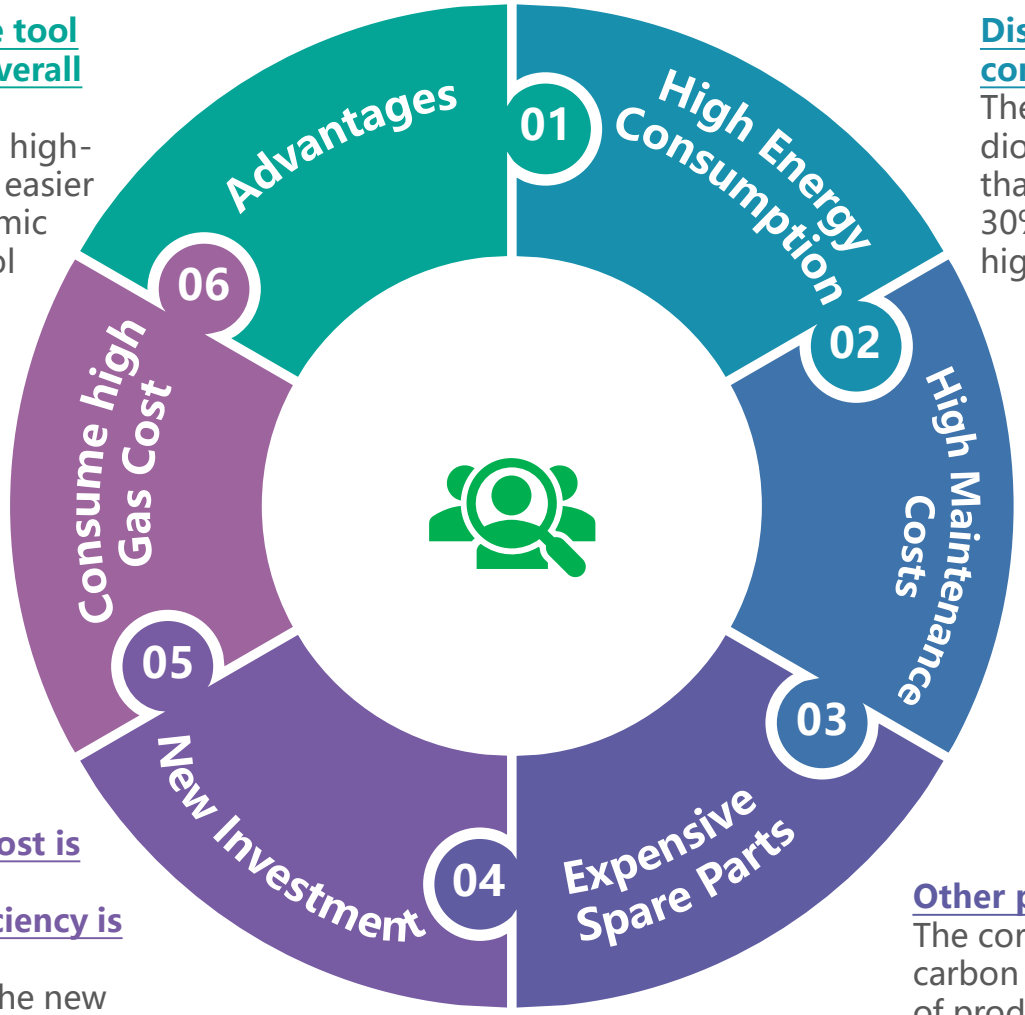
Current problems: brand, performance, cost, expense

Advantages: The original machine tool has a good brand and excellent overall performance.
Imported cutting machine tools are high-end brands, high initial investment, easier to receive contracts, excellent dynamic performance, excellent machine tool structure and CNC control system performance.

Disadvantages: Gas laser consumes high gas cost.
Carbon dioxide lasers need to consume laser gas to increase operating costs, while fiber lasers are solid-state lasers without laser gas.

New investment: the one-time cost is higher, there is no exchange workbenches, and the work efficiency is low.
The one-time investment cost of the new machine is too high. Under current economic conditions, investment needs to be cautious.

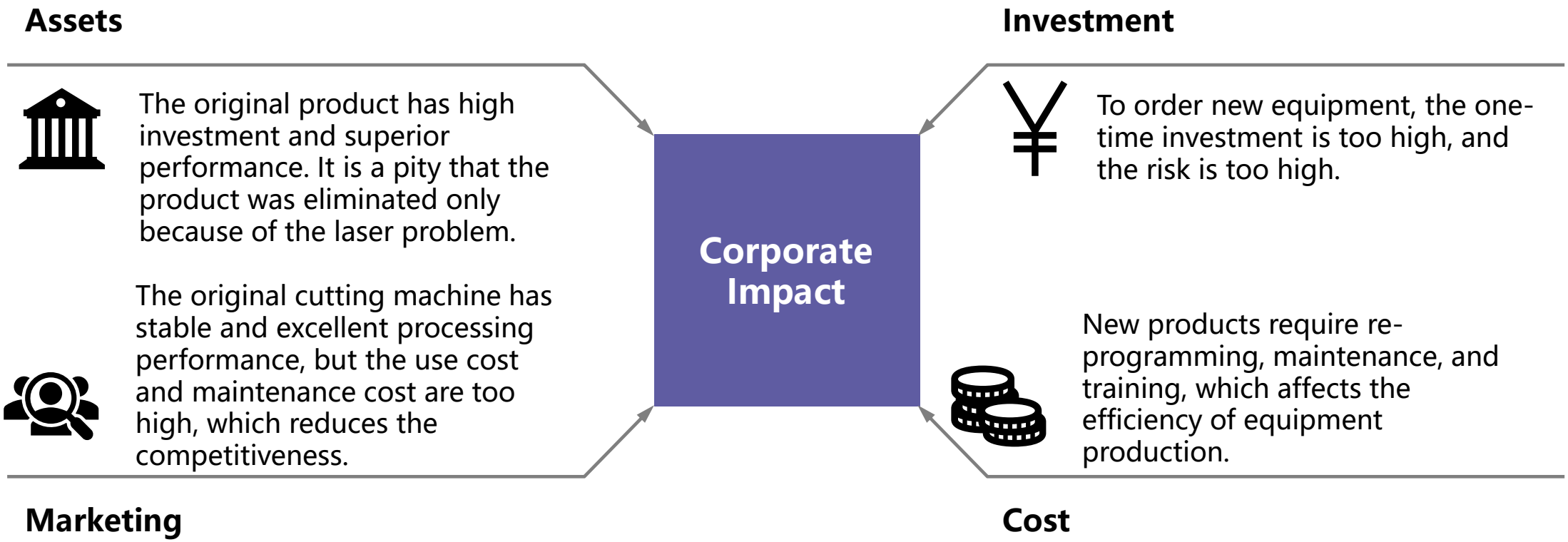


Disadvantages: high energy consumption of gas lasers.
The electro-optical efficiency of carbon dioxide laser is 10%, which is much lower than that of optical fiber by more than 30%, and the same power consumes higher energy.

Disadvantages: high maintenance costs for gas lasers.
The traditional carbon dioxide laser adopts mirror reflection, the structure is complicated, the maintenance is more complicated, and the maintenance cost is high.

Other problems: expensive spare parts.
The core component of the machine tool carbon dioxide laser is facing suspension of production, technology is eliminated, and the cost of core components is high.

The impact of the problem:
It won’ t work if you don’ t turn it on, you lose money when you turn it on.



It is the best solution to upgrade the original high-end laser machine to fiber machine.

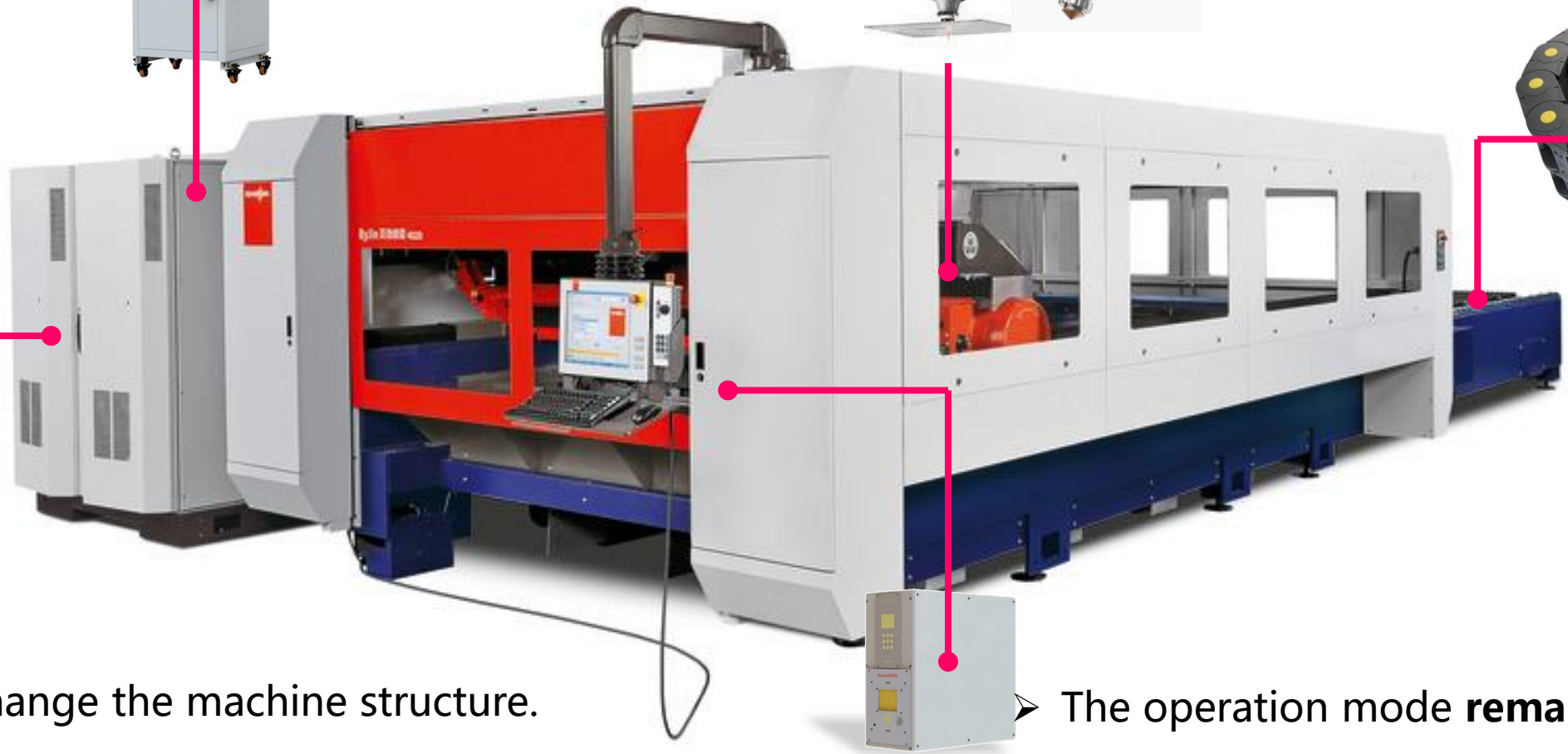
Solution

Upgrade: fiber cutting head Germany Precitec

Replace the chiller

Upgrade: fiber laser generator

Change X, Y, Z Axis drag chains



Add AICS Controller

- Do not change the machine structure.
- Do not replace the drive system.
- The operation mode **remains the same**.
- The CNC system **remains the same**.

Value for Customer

High Comprehensive Economic Value

- Upgrade the optical fiber, the electro-optical efficiency is as high as 30% or more, saving electricity cost
- Upgrade to fiber, 5-year maintenance-free, 5-year warranty, more worry-free
- No gas source is needed, saving gas cost
- No need to replace the operating system and control system, saving learning costs
- On-site implementation, high-efficiency transformation, upgrade the fiber within **3 days** at the earliest.
- Once upgraded, the equipment will be used for another 10 years.
- Ensure the excellent mechanical and numerical control performance of imported machines

Equipment Reuse **100%**

Equipment Efficiency Improvement **30%**

Reduce Operating Costs **50%**

Value for Customer

Low Equipment Maintenance Costs

- The laser has high integration, small size and low maintenance cost
- Shorter wavelength 1.08μm
- Metal absorption rate **35%**
- The electro-optical conversion rate is high, **up to 30% or more**.
- Optical fiber transmission
- Life can reach 100,000 hours, maintenance-free

- No need for lens protection gas;

- Good effect in cutting **non-ferrous metals**, such as stainless steel, aluminum, copper and other materials;

- Need a gas generator, consume gas
- Wavelength is 10.6μm
- Metal absorption rate 12%
- The electro-optical conversion rate is 10%~15%
- Lens reflection transmission
- The service life is about 20,000 hours, and the maintenance is 2,000 hours
- Need high purity N2 pressure 0.5MPa to protect the lens
- Not easily absorbed by high reflective metal materials such as copper and aluminum

Fiber Laser Generator VS CO2 Laser Generator

Value for Customer

Fiber Laser Cutting Ability (for reference)

Material	Fiber 3000W	Fiber 4000W	Fiber 6000W	Fiber 8000W	Fiber 12000W
Mild Steel	20mm	20mm	25mm	30mm	40mm
Stainless Steel	12mm	15mm	25mm	30mm	30mm
Aluminum Alloy	10mm	14mm	25mm	30mm	30mm
Brass	10mm	10mm	12mm	16mm	16mm
Copper	5mm	6mm	8mm	10mm	10mm

Value for Customer

Operating Costs are Significantly Reduced

CO2 Laser Cutting Machine	Energy Consumption per Hour
3KW	45KW
4KW	60KW
6KW	75KW

Fiber Laser Cutting Machine	Energy Consumption per Hour
3KW	20KW
4KW	24KW
6KW	30KW

- Under the same power, the energy consumption of the fiber laser cutting machine is reduced to at least half of the original. The higher the operating rate of the equipment, the more obvious the savings in electricity costs.
- Fiber lasers do not require laser gas generation, saving nearly 2000 USD in laser gas costs each year.
- The fiber laser cutting machine can use air cutting, saving nearly 2000 USD of nitrogen every year.
- After the equipment is upgraded, the laser obtains a new warranty, 6KW warranty for 5 years, which is more worry-free.
- Equipped with German imported Precitec cutting head, stable performance.

Success Case

Wuxi Customer
ByJin4020-6KW

Wuhan Customer
TruLaser3030-6KW

Dongguan Customer
Byjin3015-3KW

Shanghai Customer
Byjin3015-3KW

Fujian Customer
BySpeed4020-3KW

Shenzhen Customer
BySprint3015-2KW

On-site Modification Plan

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TA LASER

Raycus laser source

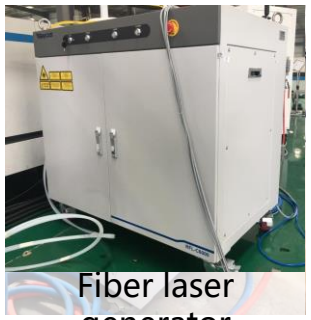
controller

Laser cutting head

Fiber laser cutting machine

Fiber upgrade site

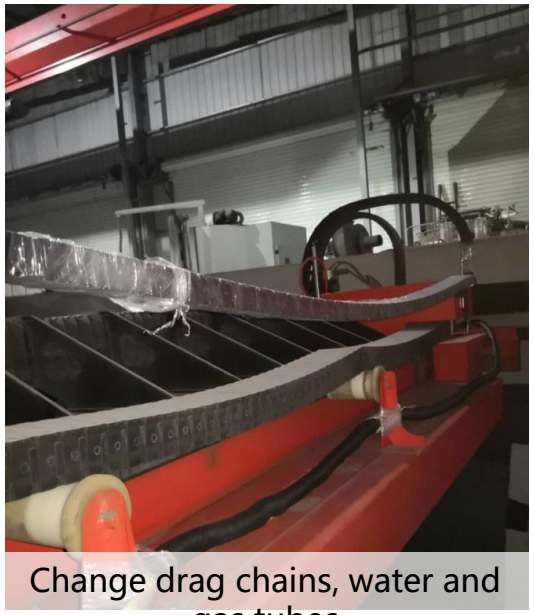
CO2 laser source



Fiber laser generator

Before

After



Change drag chains, water and gas tubes

Change laser cutting head

Controller Installation

Configuration List

Configuration	Brand	Origin
Fiber laser generator（4000W）	RAYCUS	Wuhan
Fiber laser cutting head	Precitec/Raytools	German
Water chiller	Tongfei	Hebei
Drag chains	Igus	German
Controller	TA	Wuhan
Upgrade Toolkit	TA	Wuhan

Complete upgrade kit and standardized hardware interface make it easier and faster to upgrade your equipment.

Summary of Advantages

Fiber upgrade for other brand cutting machines

Upgrade of Bystronic cutting machine

ByJin

BySpeed

BySprint

ByStar

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Upgrade of Trumpf cutting machine

TRUMPF

TruLaser 3020 BE

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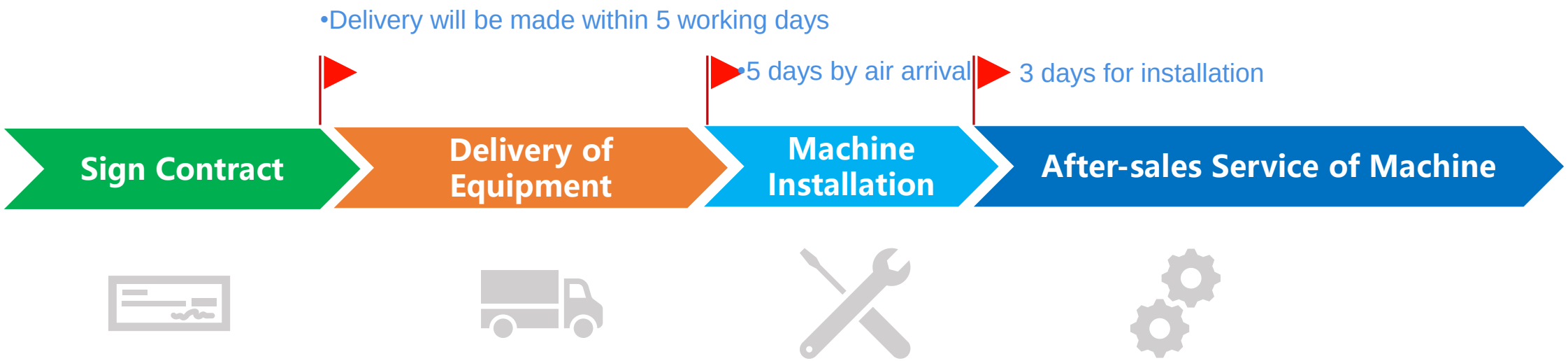
Delivery instructions

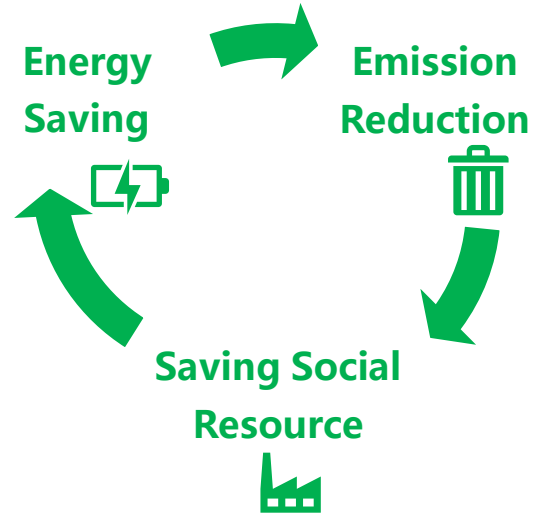


Product Features and Advantages

Realize the upgrade of traditional CO2 laser to fiber laser-Direct Replacement

AICS Core Functions:

- Realize the upgrade of optical fiber, the electro-optical efficiency is as high as 30%, saving energy.
- Realize the upgrade of optical fiber, **no need laser gas source**, reduce exhaust gas emission.
- Realize **100% reuse of equipment**, **reduce investment by 50%,** and save social resources.
- Realize fiber cutting head control, **automatic focusing and alarm functions**
- Delivery in 1 week, **production in 3 days**
- Realize the process monitoring of CNC process parameters to ensure **processing quality**



Realizable functions:

Running Time

Processing Time

Running Status

Process Parameters

Economic Value:

50% reduction in operating costs, 100% reuse of equipment,

200% improvement in equipment efficiency

Social value: Environment Protection