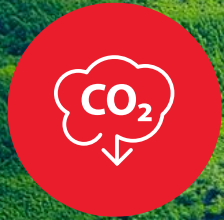


ESG: Carbon neutralization in Danfoss CC

Chuanhua Lu
1st Apr 2023

Danfoss ESG Ambition 2030



We pioneer solutions
for customers
to **enable
decarbonization**

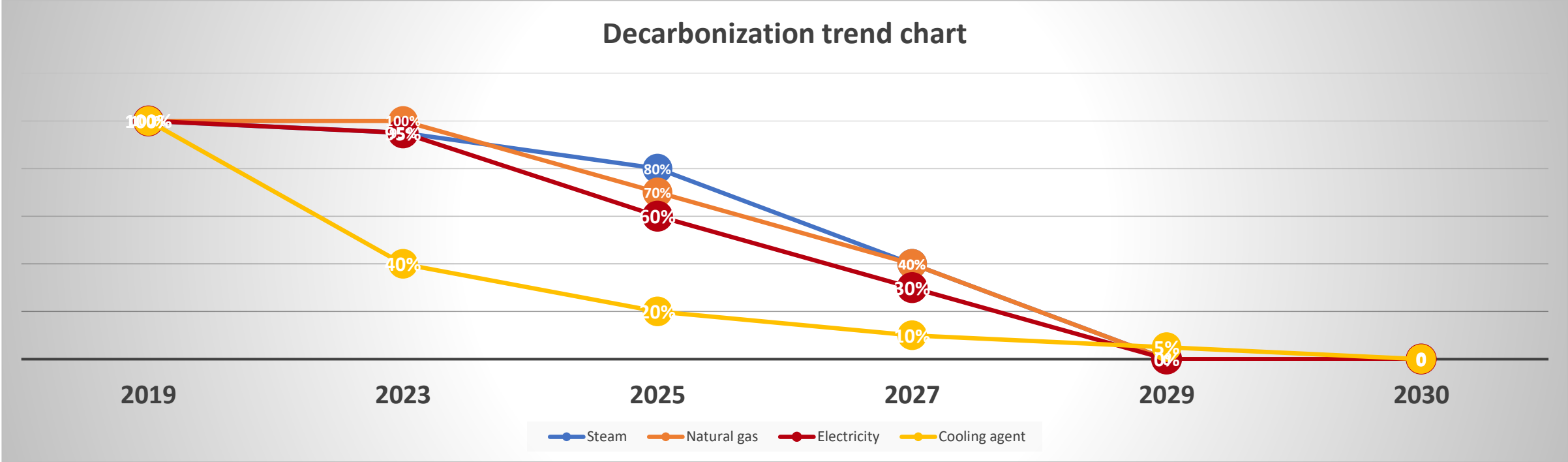


We innovate
best-in-class
circular products



We offer a leading
employee experience
that values and
respects **diversity
and inclusion**

Danfoss CC Carbon Neutralization Roadmap to 2030



Base 2019

2023 –

Electricity -5%
(Reduce waste)
Steam -5%
(Reduce leakage)
Cooling agent -60%
(Optimize/Reclaim/Replace)

2025 –

Electricity -5%
(Reduce waste)
Use PPA -30%
(Buy green energy)
Steam -15%
(Cancelled for use in production-Heat pump)
Natural gas -30%
(Switch to electricity)
Cooling agent -20%
(Optimize/Reclaim/Replace)

2027 –

Use PPA -30%
(Buy green energy)
Steam -40%
(GS-reduce heating use in half)
Natural gas -30%
(Switch to electricity)
Cooling agent -10%
(Optimize/Reclaim/Replace)

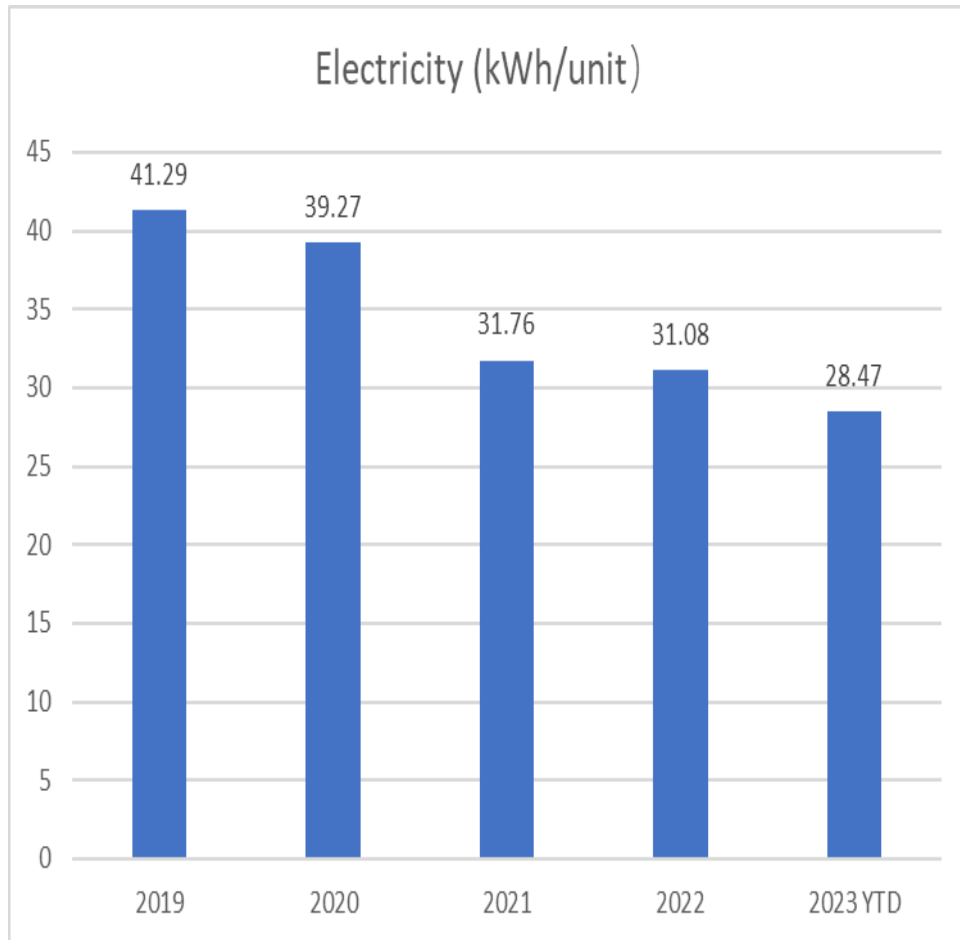
2029 –

Full electrification
Use PPA -30%
(Buy from the energy market)
Steam -40%
(GS-reduce total heating use)
Natural gas -40%
(Switch to electricity)
Cooling agent -5%
(Optimize/Reclaim/Replace)

2030 –

Carbon neutral
(The remaining 5% cooling agent depends on the local policy)

Energy Saving Achievement & Main Actions



- 31% improvement VS 2019

- 1 Minimize Machine Running Time
- 2 Precise control
- 3 Process innovation
- 4 Design innovation
- 5 New Technology

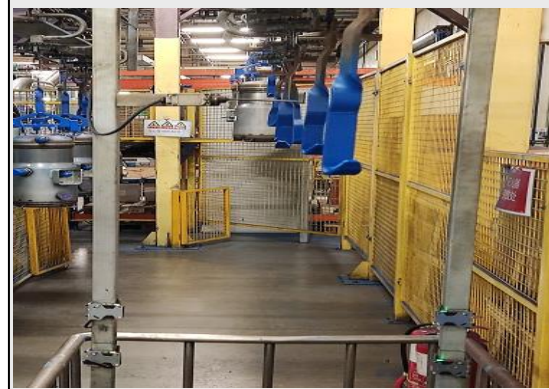
1 Minimize Machine Running Time



Assembly line conveyor, auto start and stop by sensor



Exhaust fan stat and stop by compressors sensor

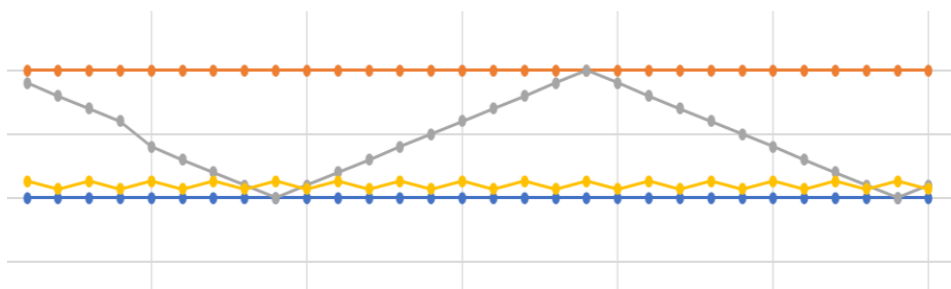


Painting Line

Painting oven, phosphating tunnel, powder painting booth start / stop automatic by sensor

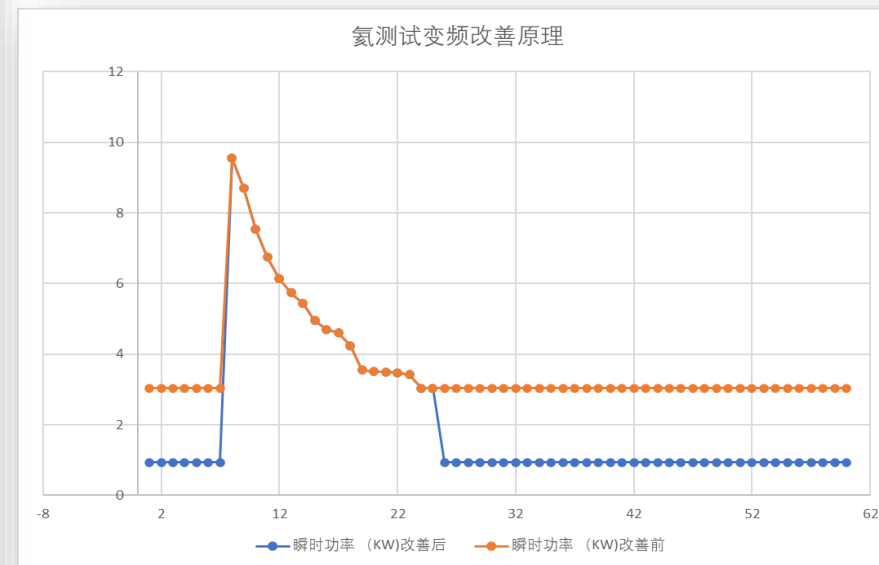


Power stop when no compressors on painting conveyor



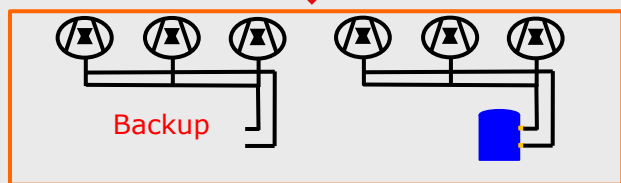
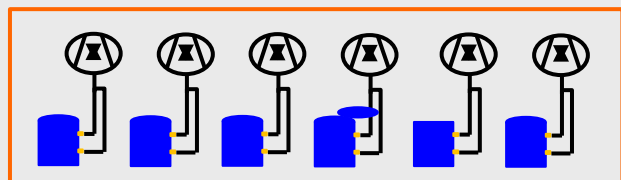
PID control

2 Precise Control -2 Variable speed

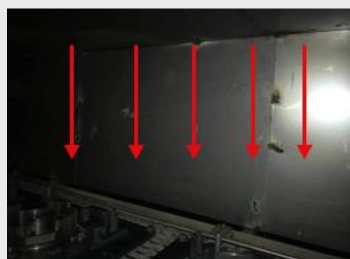


Variable speed

3 Process innovation



Six station dehydration, combine 3 in 1, stop 3 pumps



Hot air drying replace by air blowing first

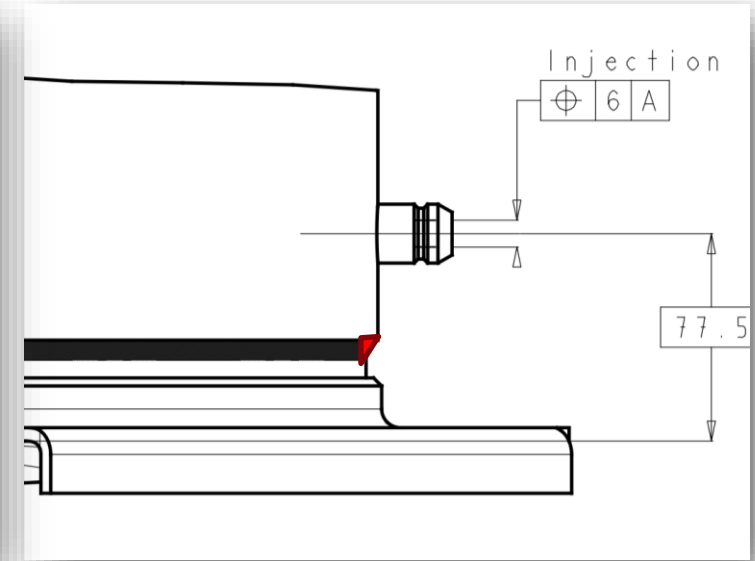
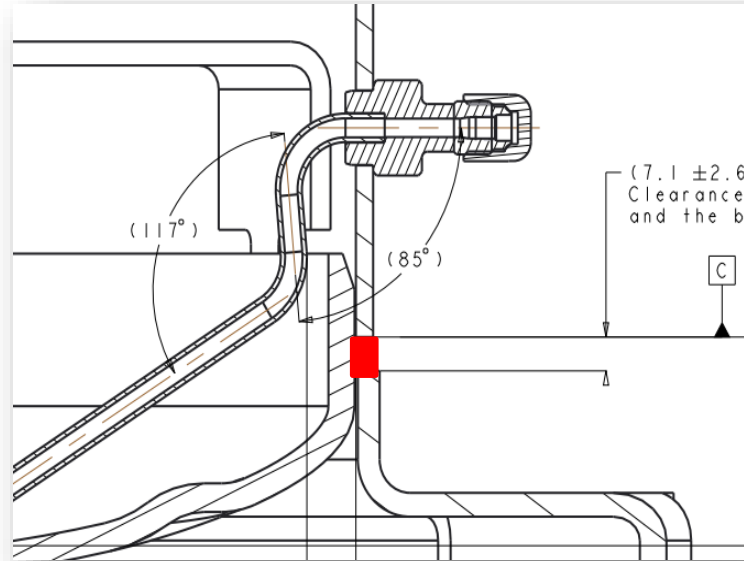
Chiller System



Optimize original piping, changed diameter and structural to reduce resistance; Add heating protection hood.



New design remove 45s induction heating time



New design reduce 50% welding time, 100s welding time



Heat pump instead of electric heating



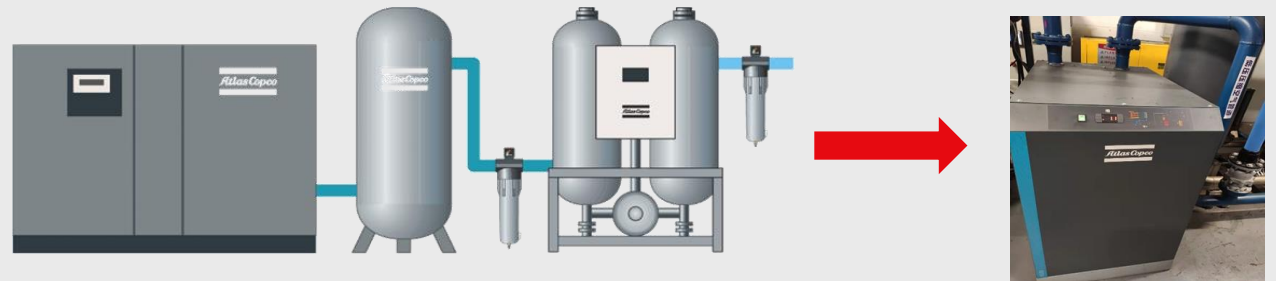
New generation IR lamp, more power focus



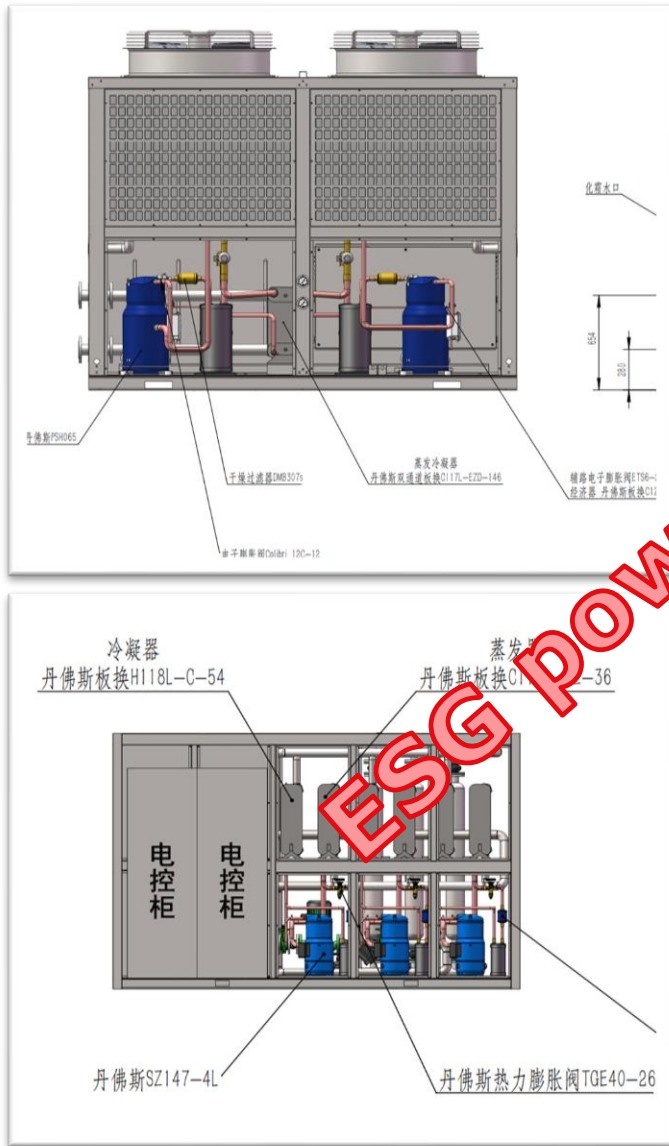
Induction heating instead hot air oven



Compressor air pip leakage check by special device



Compressed Air Drying: Replace the regenerative dryer with a cold dryer.
Saving:



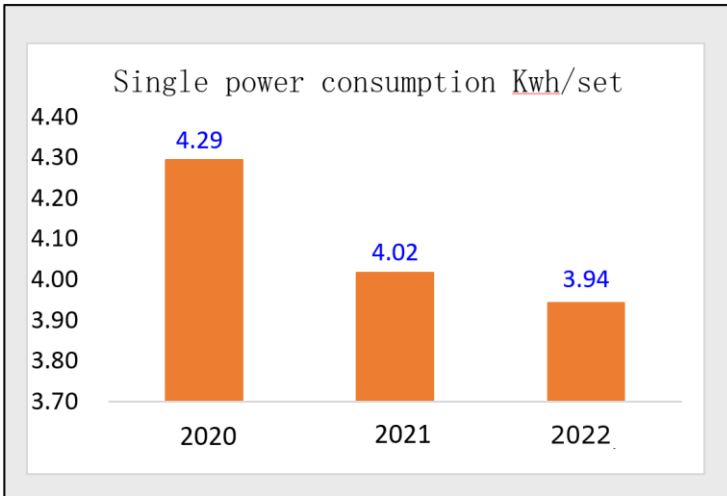
ESG power by Danfoss



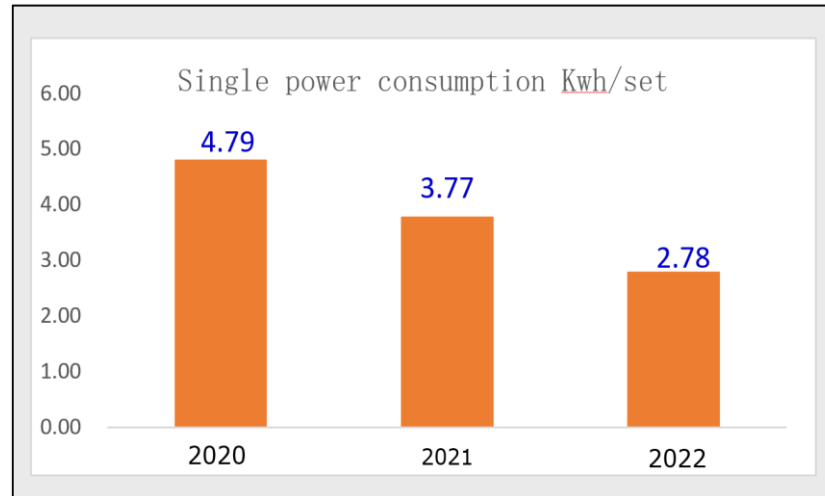


Benefit: Part of High Power-Consumption Machines

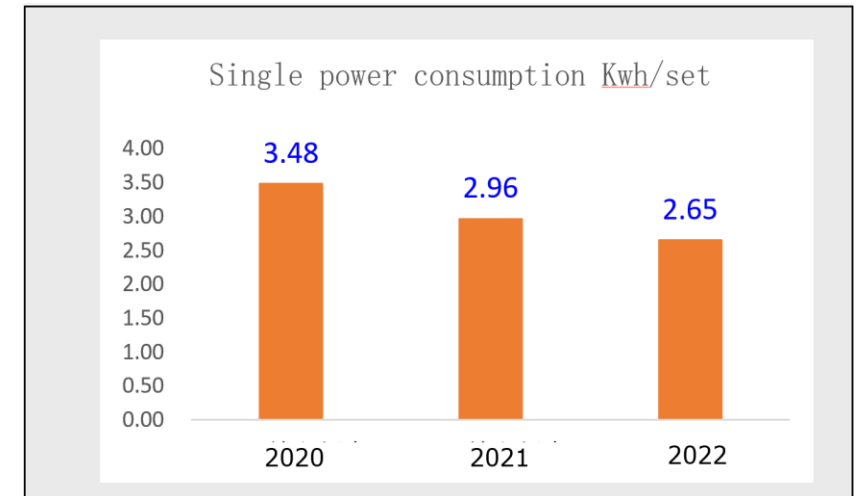
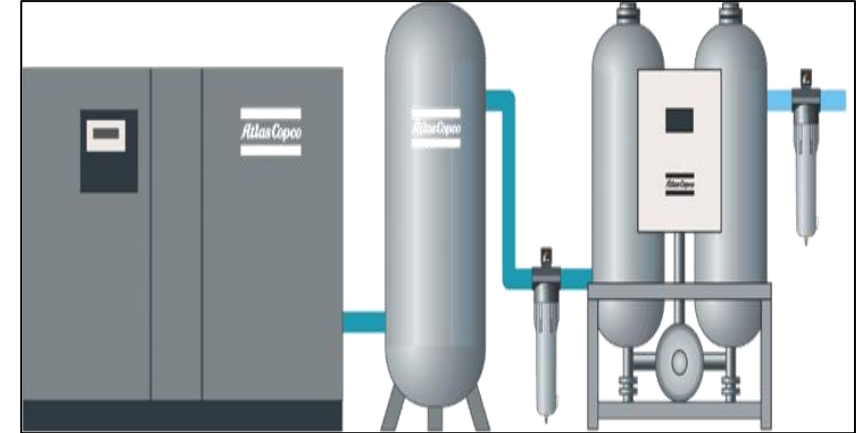
Nelico Painting



Performer Washing



Compressed Air



Next Steps

- Refrigerant
- More heat pump(drying machine heat pump)
- Solar energy
- Energy saving robot
- Energy storage
- Waste energy re-use

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