FE4

EVAPORATORS INC.

MVR Heat Pump

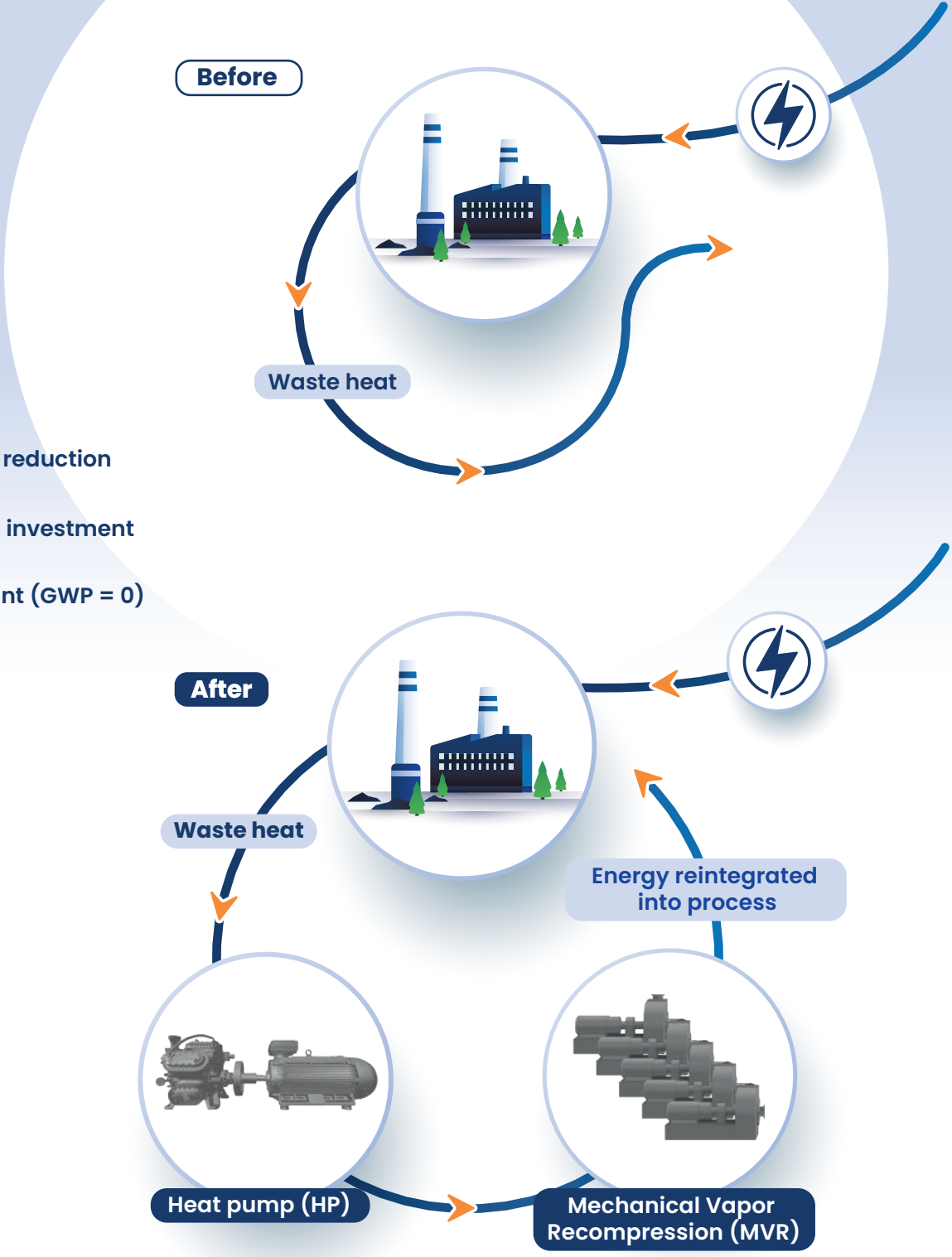
MAXIMIZE SAVINGS.
MINIMIZE CARBON.

AN INNOVATIVE APPROACH TO INDUSTRIAL ENERGY EFFICIENCY

Mechanical Vapor Recompression
Industrial Heat Pumps

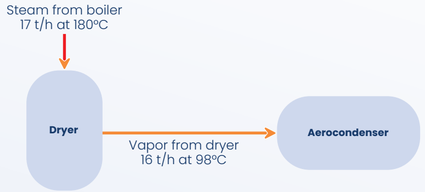
Key highlights:

- COP up to 50
- 98% CO_2 emission reduction
- <5 years return on investment
- Water as refrigerant (GWP = 0)
- Easy integration



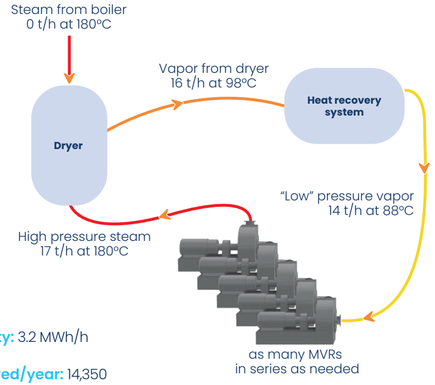
Dryer with MVR

Before



Key figures:
- **Thermal:** 12 MWh/h
- **Electricity:** 22 kWh/h
- **tCO₂ emitted/year:** 14,350

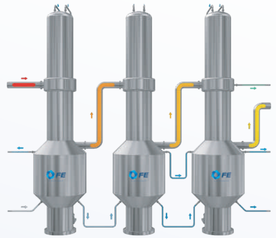
After



Key figures:
- **Electricity:** 3.2 MWh/h
- **COP:** 3.3
- **tCO₂ saved/year:** 14,350
- Non-intrusive system: no impact on production

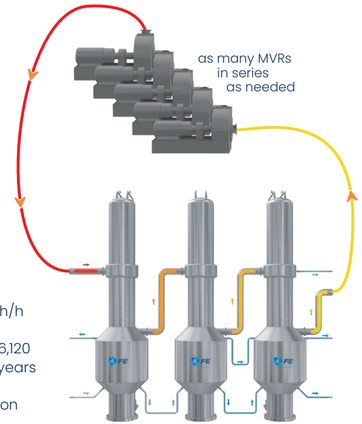
Multiple Effect Transformation with MVR

Before



Key figures:
- **Thermal:** 4.4 MWh/h
- **tCO₂ emitted/year:** 6,120

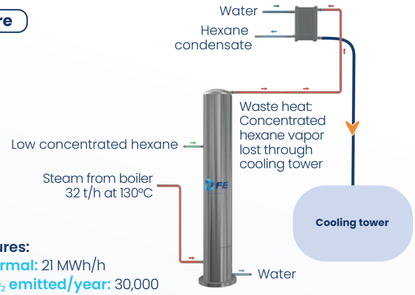
After



Key figures:
- **Electricity:** 940 kWh/h
- **COP:** 4.7
- **tCO₂ saved/year:** 6,120
- Payback: less than 3 years
- Non-intrusive system: no impact on production

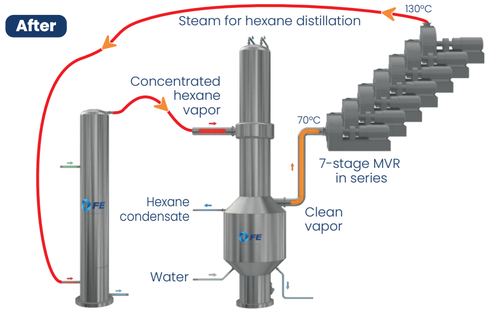
Distillation column with MVR

Before



Key figures:
- **Thermal:** 21 MWh/h
- **tCO₂ emitted/year:** 30,000

After



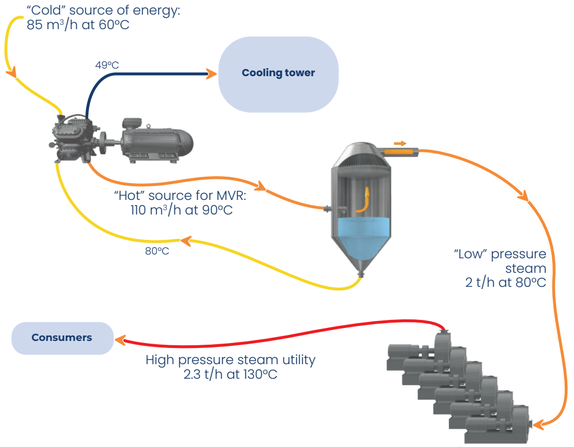
Key figures:
- **Electricity:** 5.2 MWh/h
- **COP:** 4.3
- **tCO₂ saved/year:** 30,000
- Non-intrusive system: no impact on production

Low scale 1.4 MW

Before

Key figures:
- **Thermal:** 1.4 MWh/h
- **tCO₂ emitted/year:** 2,020

After



Key figures:
- **Electricity:** 602 kWh/h
  - HP: 330 kWh/h
  - MVR: 272 kWh/h
- **tCO₂ saved/year:** 2,020
- **Global COP:** 2.6
  - HP **COP:** 4
  - MVR **COP:** 5.7
- Non-intrusive system: no impact on production

EXAMPLES OF ENERGY EFFICIENCY PERFORMANCE IMPROVEMENTS IMPLEMENTED

	Steam saved		Temperatures °C			COP	CO_2 savings
	kg/h	kWh/h	Initial	Final	Lift		tons/year
Evaporators	6,400	4,400	65	125	+ 60	4.7	6,120
	7,000	4,900	55	115	+ 60	4.4	6,600
	9,300	6,900	55	115	+ 60	5.2	8,800
	23,100	16,000	80	90	+ 60	13	23,550
Crystallization units	22,000	15,200	62	110	+ 48	6.3	21,630
	12,000	8,900	90	105	+ 15	9.9	11,800
Distillation columns	32,000	21,500	70	132	+ 62	4.8	30,000
	27,000	21,500	75	105	+ 30	8.8	26,200
Dryers	20,800	11,800	90	172	+ 82	2.75	19,000
	2,100	1,460	20	105	+ 85	4.1	2,000
Entire plant	4,800	3,300	40	91	+ 51	6.35	4,700

FE4 EVAPORATORS INC.

FE4 EVAPORATORS INC.
PO Box 212, Texarkana, TX, 75504
+1-430-200-8066
contact@evaporation.com
www.evaporation.com/us