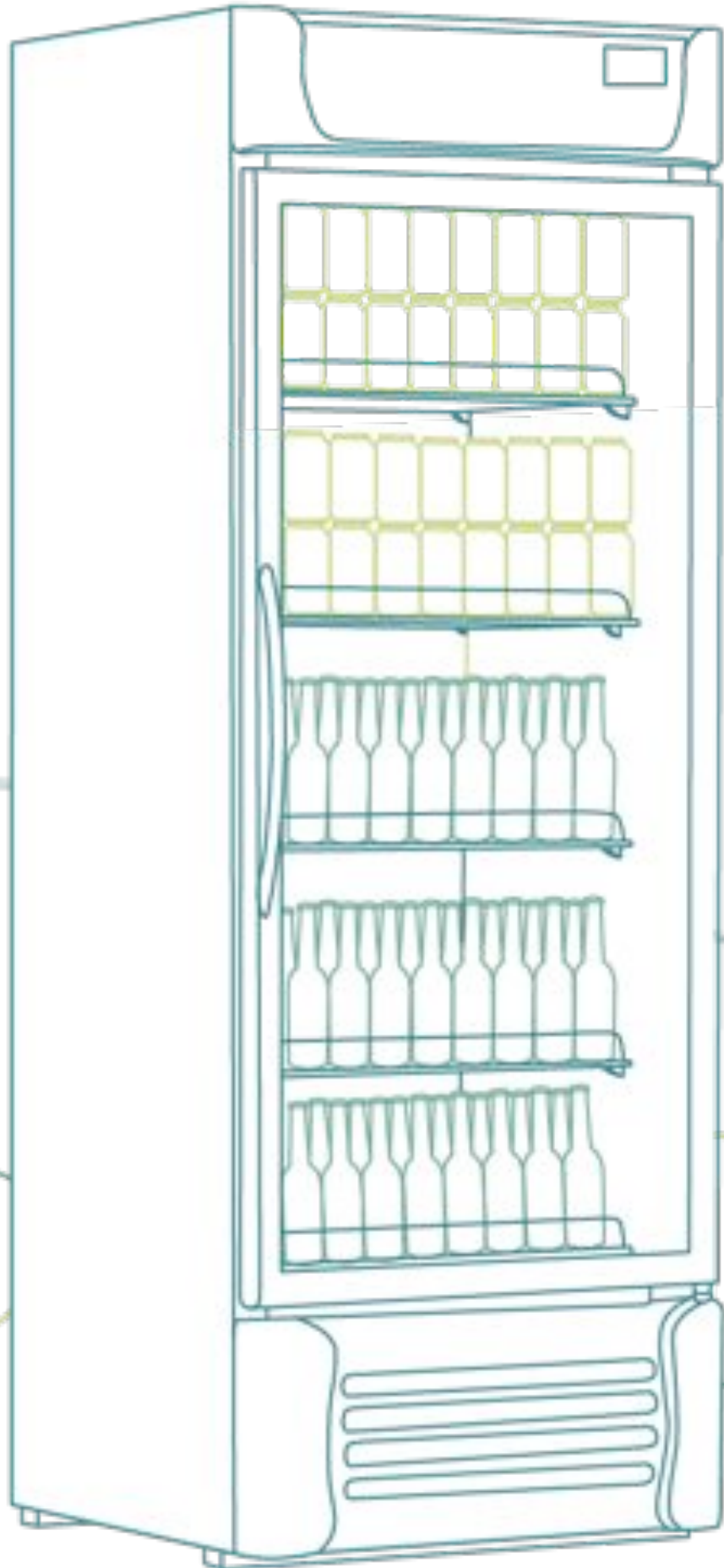


HOW

**EMBRACO PROPANE COMPRESSORS
CAN HELP YOU REACH
2017 "DOE" REQUIREMENTS ?**





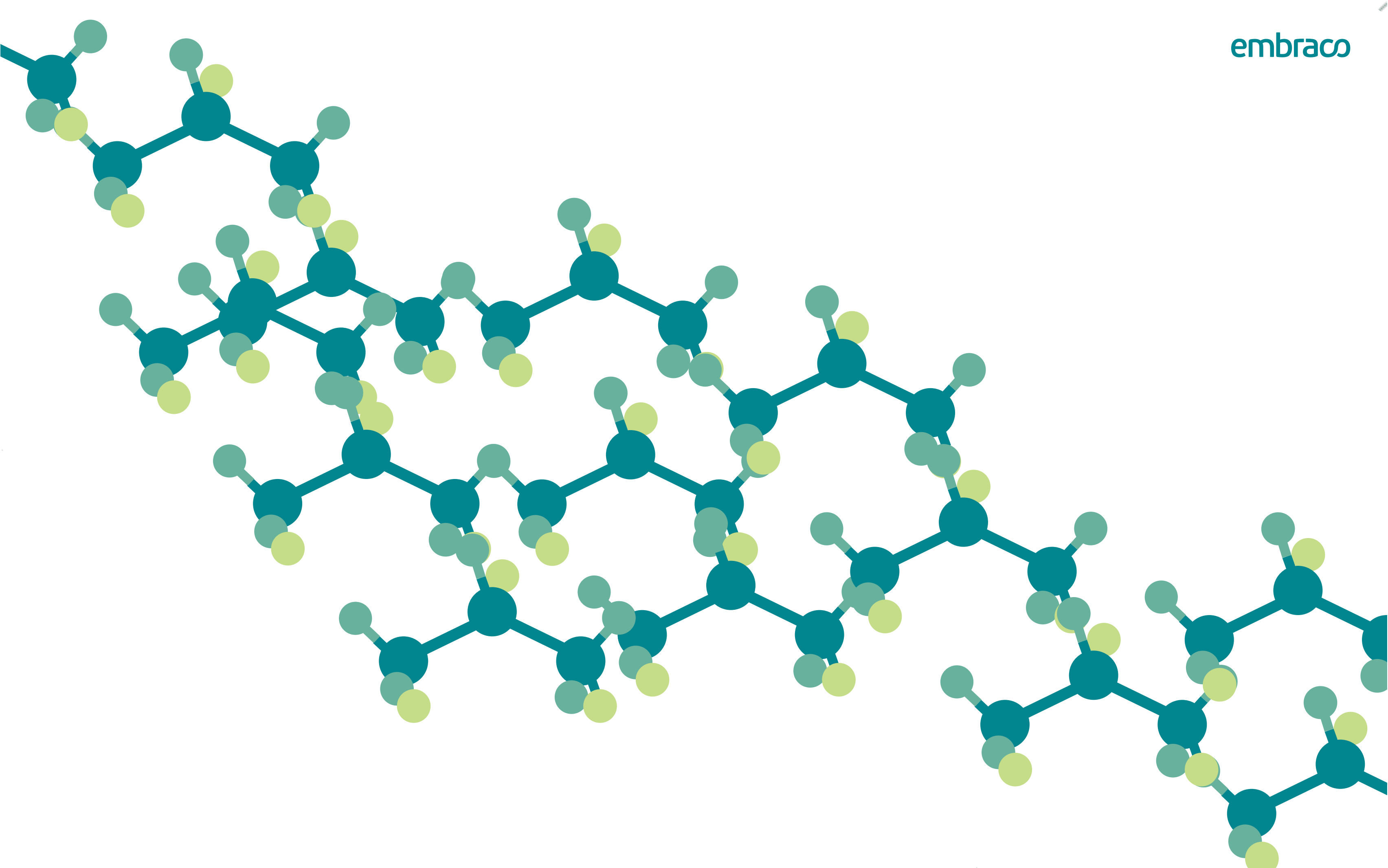
PENDING 2017 DOE
ENERGY STANDARDS

FOR COMMERCIAL APPLIANCES
WILL PRESSURE OEM'S
TO REACH NEW DESIGN LIMITS



**WHICH IS THE
BEST TRACK?**

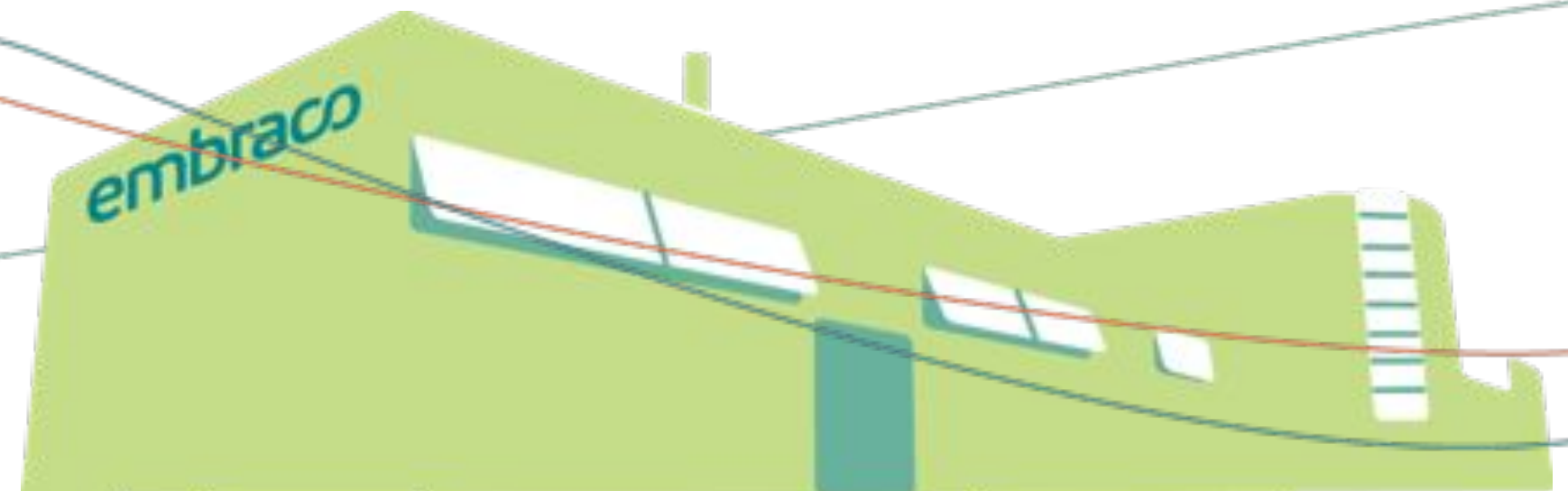






R-290

EFFICIENCY
POWER PLANT INVESTMENTS





R-290

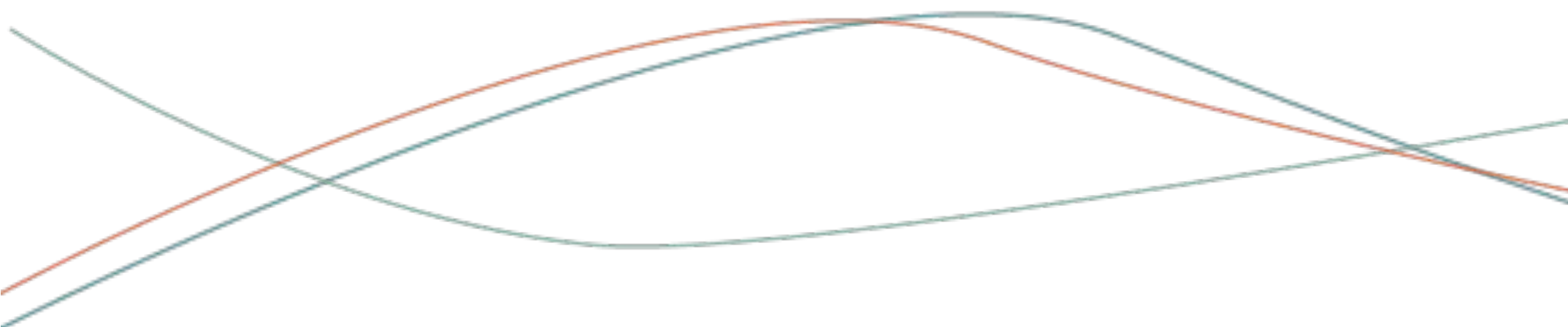
SAVING MONEY
FOR RETAILERS



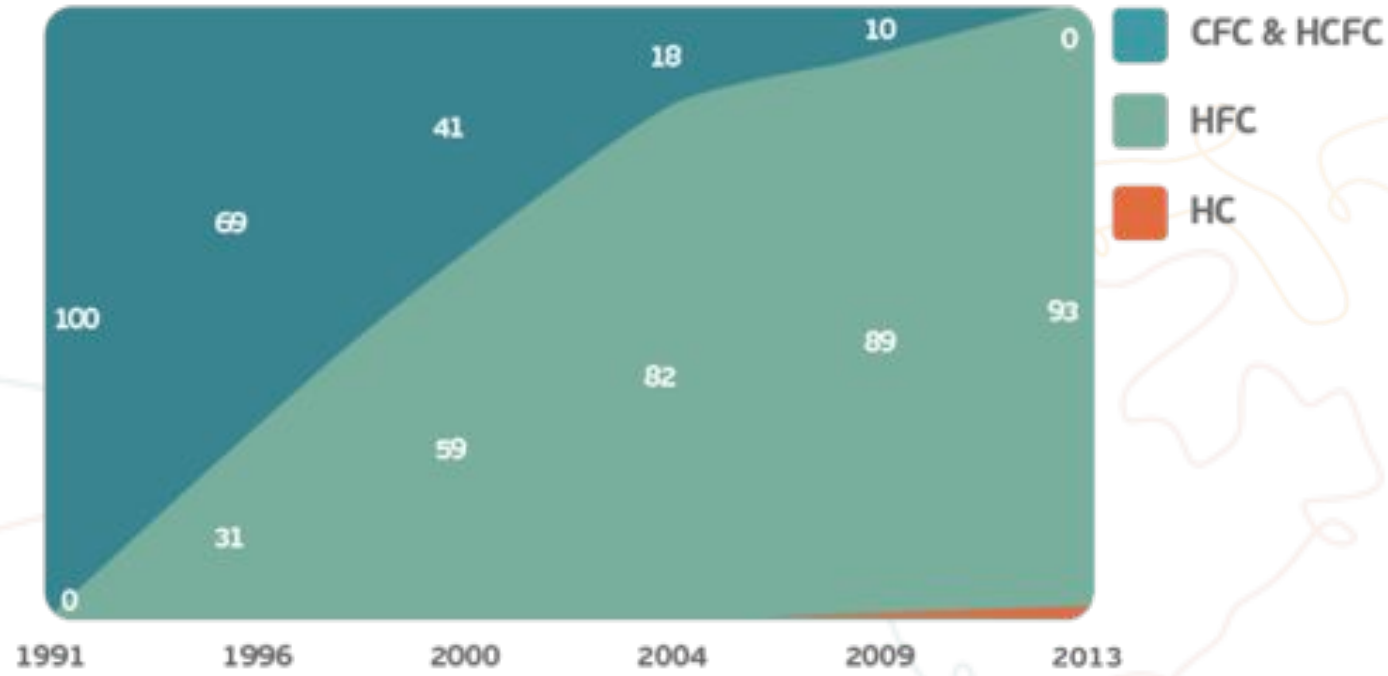


R-290

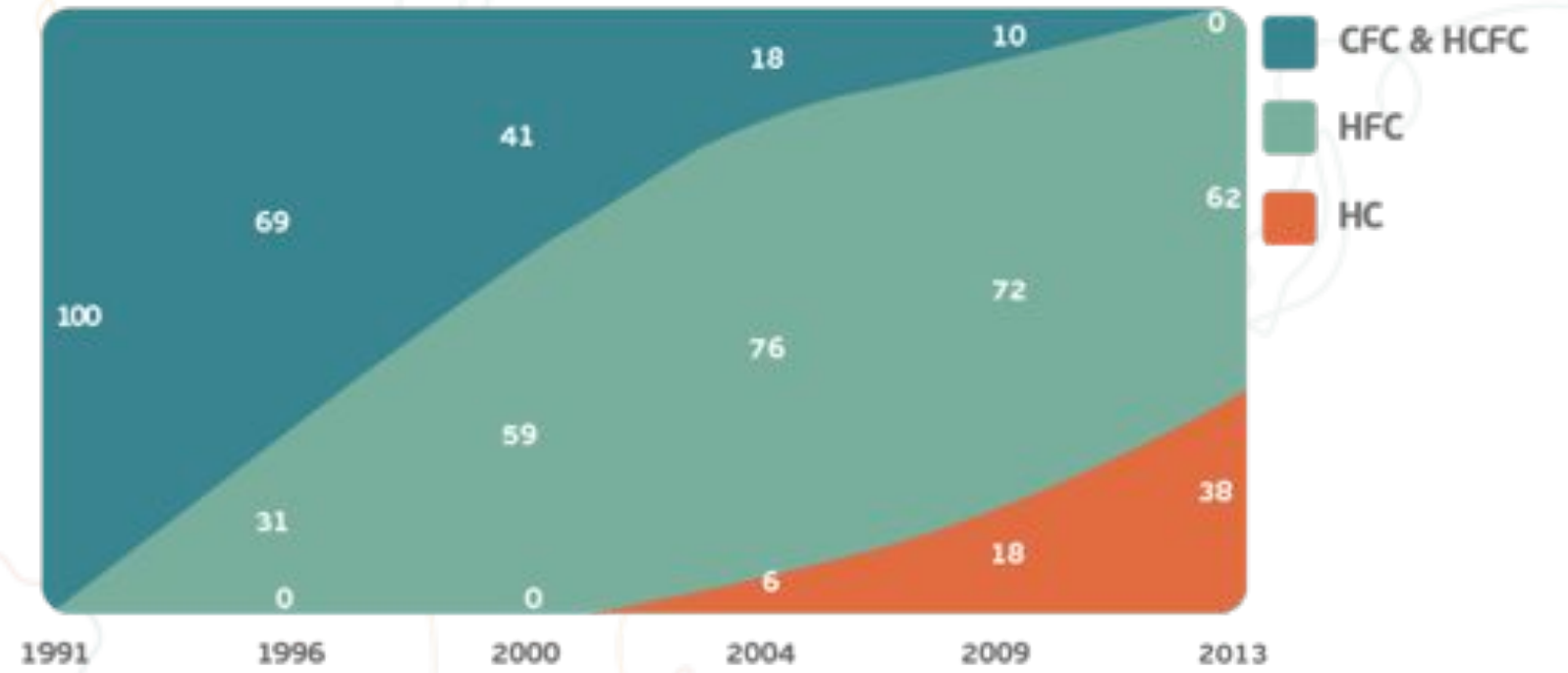
SUSTAINABILITY
FOOTPRINT CO₂ / GWP



SALES BY REFRIGERANT
NORTH AMERICA (%)



SALES BY REFRIGERANT
EUROPE (%)



EMBRACO
LIGHT COMMERCIAL
EUROPEAN &
NORTH AMERICAN
MARKET

CASE STUDY 1
SMALL (10 CUFT) GLASS DOOR MERCHANDISER
EMBRACO COMPRESSOR MODEL EMIS50UER R-290



<i>True</i>	R-134a	R-290	SAVINGS
	2.080 kWh/day	1.394 kWh/day	250 kWh/year
	102 USD	68 USD	33%
	4151 kg CO ₂	2585 kg CO ₂	783 kton CO ₂ in 10 years
DOE 2017 ▶ 1.780 kWh/day			

US\$ per kwh (Washington DC) = 0.1342 / Number of GDM's in US 2013 = 500,000

CASE STUDY 2

MEDIUM (26 CUFT) GLASS DOOR MERCHANDISER

EMBRACO COMPRESSOR MODEL FFU130U R-290

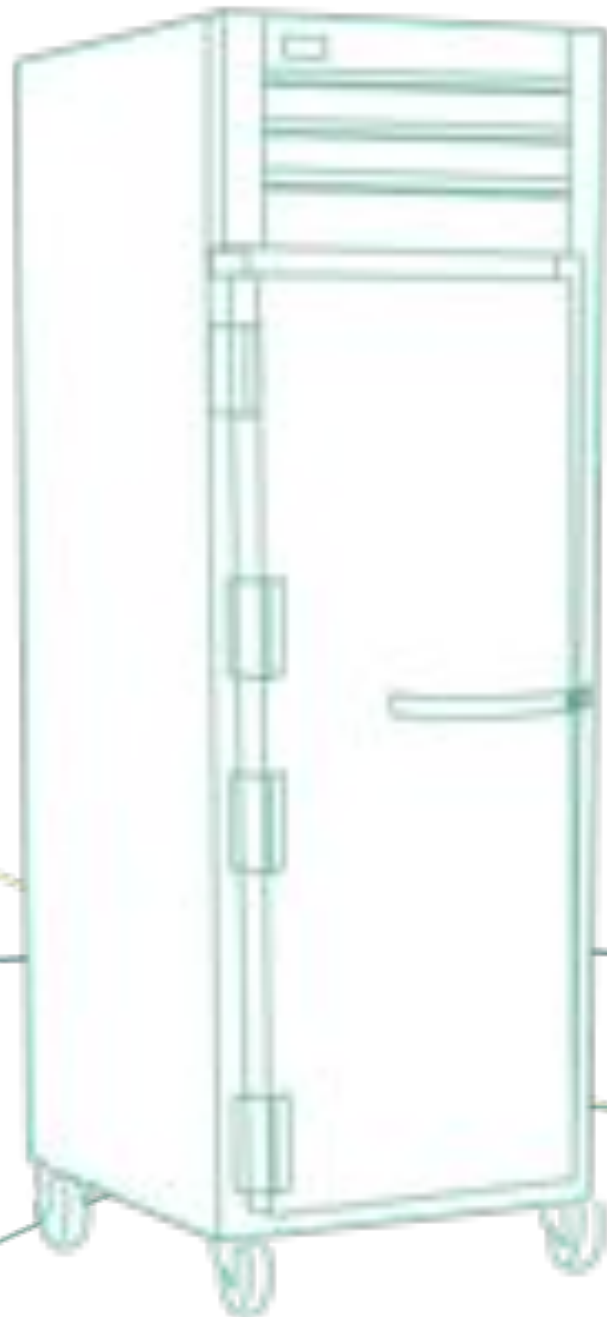


<i>true.</i>	R-134a	R-290	SAVINGS
	3.270 kWh/day	2.220 kWh/day	383 kWh/year
	160 USD	109 USD	32%
	6395 kg CO ₂	4117 kg CO ₂	1139 kton CO ₂ in 10 years
DOE 2017 ▶ 3.160 kWh/day			

US\$ per kwh (Washington DC) = 0.1342 / Number of GDM's in US 2013 = 500,000

CASE STUDY 3

MEDIUM (22 CUFT) SOLID DOOR REACH-IN EMBRACO COMPRESSOR MODEL NT2160U R-290



<i>True</i>	R-404A	R-290	SAVINGS
	7.285 kWh/day	6.067 kWh/year	445 kWh/year
	357 USD	297 USD	17%
	14636 kg CO ₂	11250 kg CO ₂	1693 kton CO ₂ in 10 years
DOE 2017 ▶ 6.209 kWh/day			

US\$ per kwh (Washington DC) = 0.1342 / Number of reach-ins in US 2013 = 100,000

STAKEHOLDERS AFFECTED





MAJOR
BARRIERS
HAVE BEEN
REMOVED

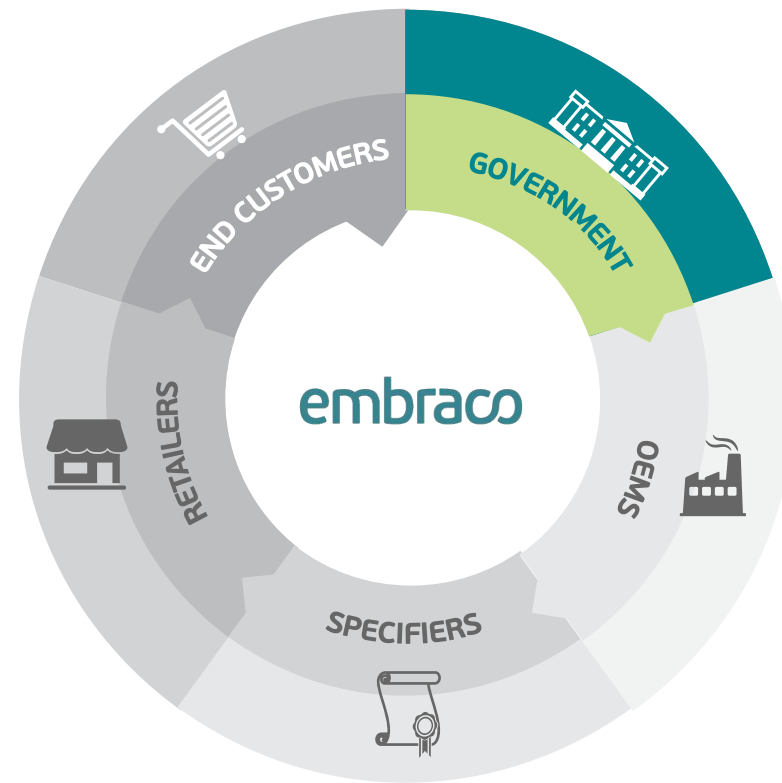




1.

RESTRAINTS

LEGISLATION



1.

RESTRAINTS



LEGISLATION

ACTION



INCREASE CHARGE LIMIT FOR COMMERCIAL TO A MINIMUM OF 350 GRAMS

THERE NEEDS TO BE AN ALIGNMENT OF CHARGE LIMIT BETWEEN R-600A AND R-290

EARLY HIGH GWP REFRIGERANT BAN FOR SMALL APPLIANCES



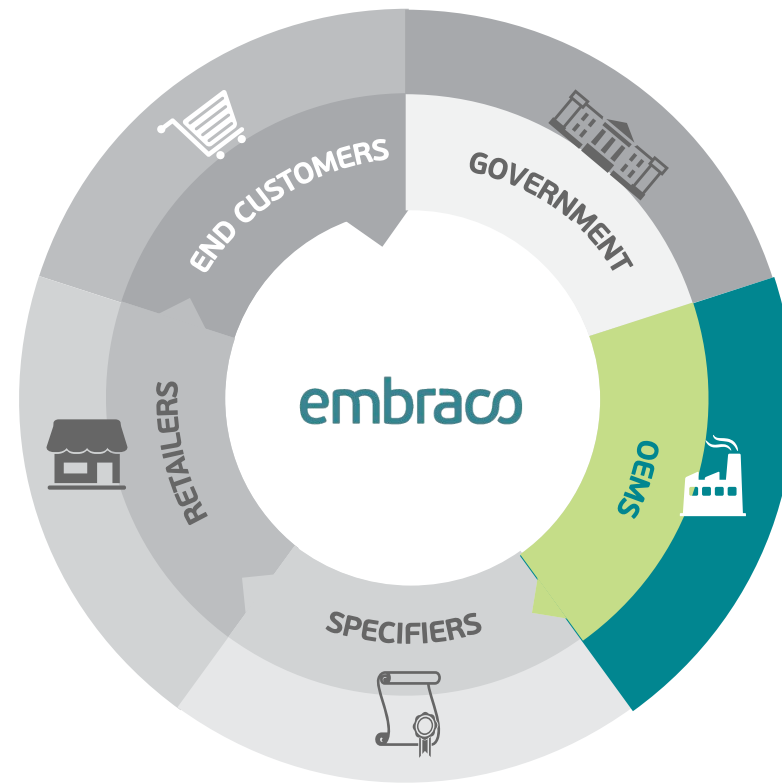
2.

RESTRAINTS



OEM INVESTMENTS FOR
MANUFACTURING PROCESS

SAFETY CONCERNS



2.

RESTRAINTS



OEM INVESTMENTS FOR
MANUFACTURING PROCESS

SAFETY CONCERNS

ACTION

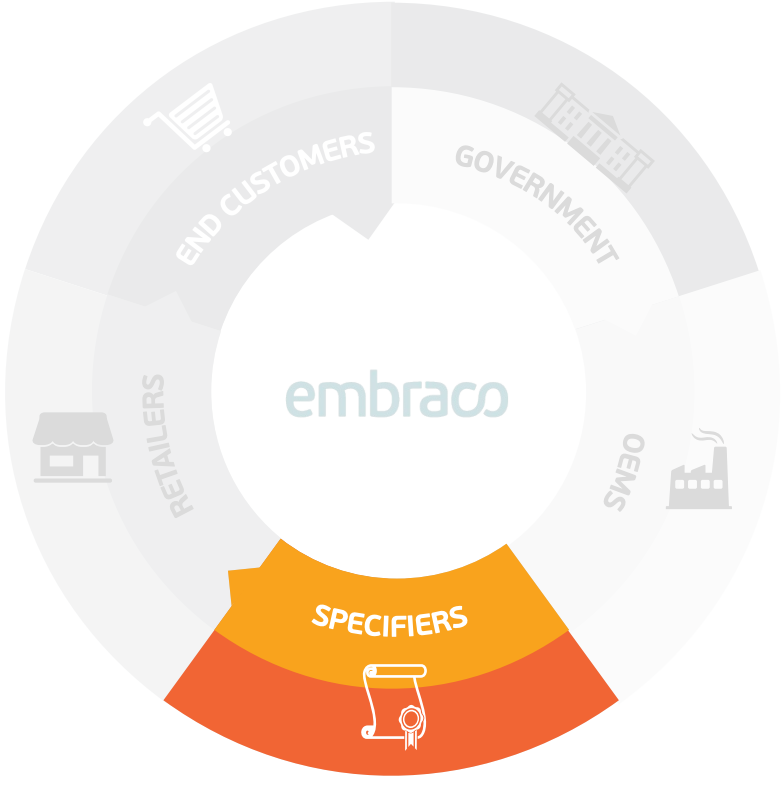


GOVERNMENTAL AND/OR POWER
UTILITIES INCENTIVES

MANDATORY PRODUCT
& PROCESS RISK ASSESSMENT

MANUFACTURING TRAINING
AND CERTIFICATION OF SERVICE PERSONNEL

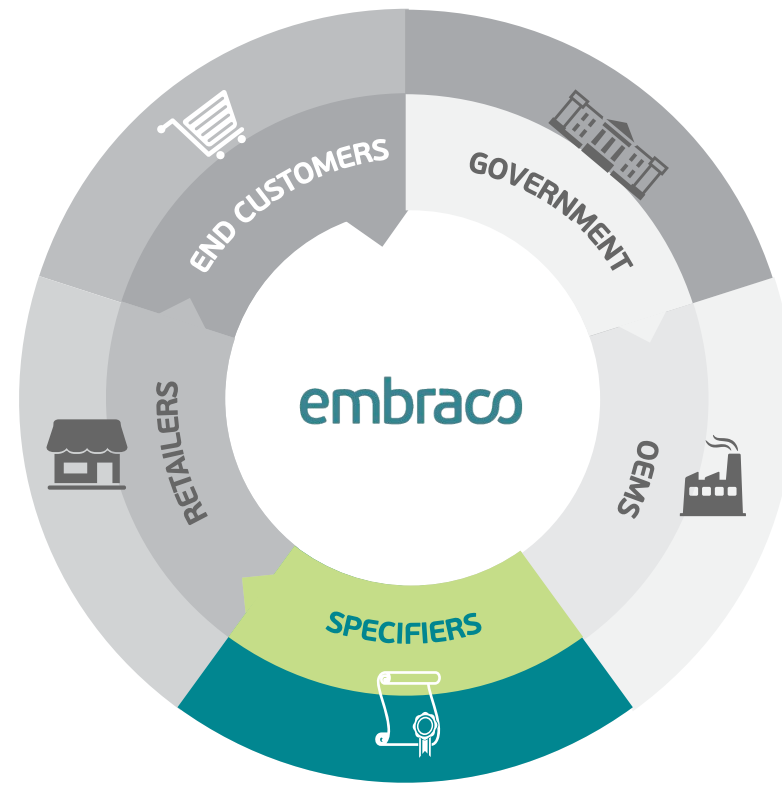
USE OF SAFER ELECTRICAL COMPONENTS
THAN MINIMUM STANDARD REQUIREMENTS



3.

RESTRAINTS

PROMOTE SUSTAINABILITY



3.

RESTRAINTS



PROMOTE SUSTAINABILITY

ACTION



DEMONSTRATE ACCEPTANCE
TOWARD NATURAL ALTERNATIVE
REFRIGERANTS

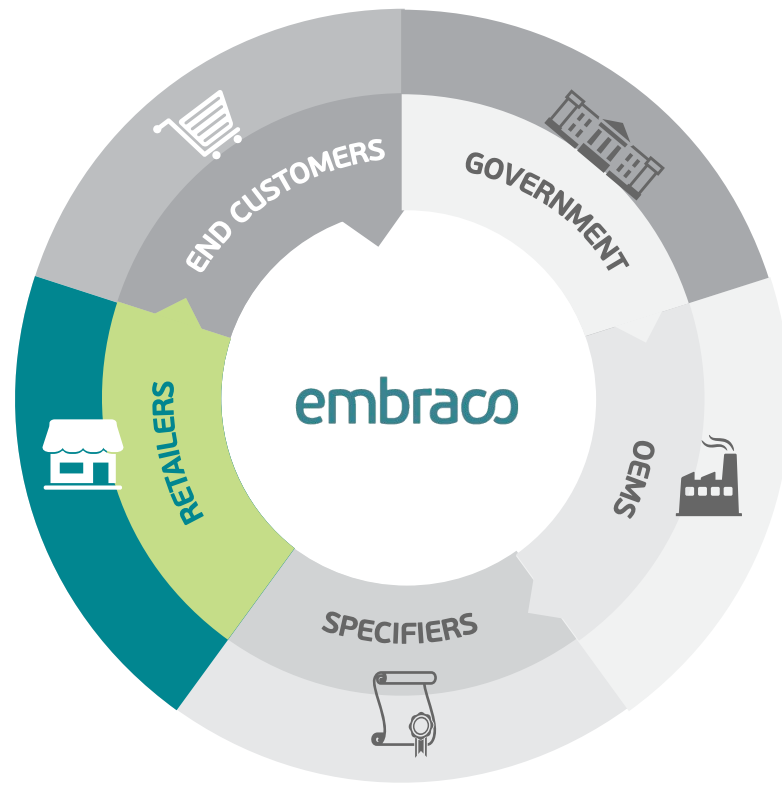


4.

RESTRAINTS



SERVICEABILITY



4.

RESTRAINTS



SERVICEABILITY

ACTION



EPA ALLOWANCE FOR VENTING HC

BARRIERS?





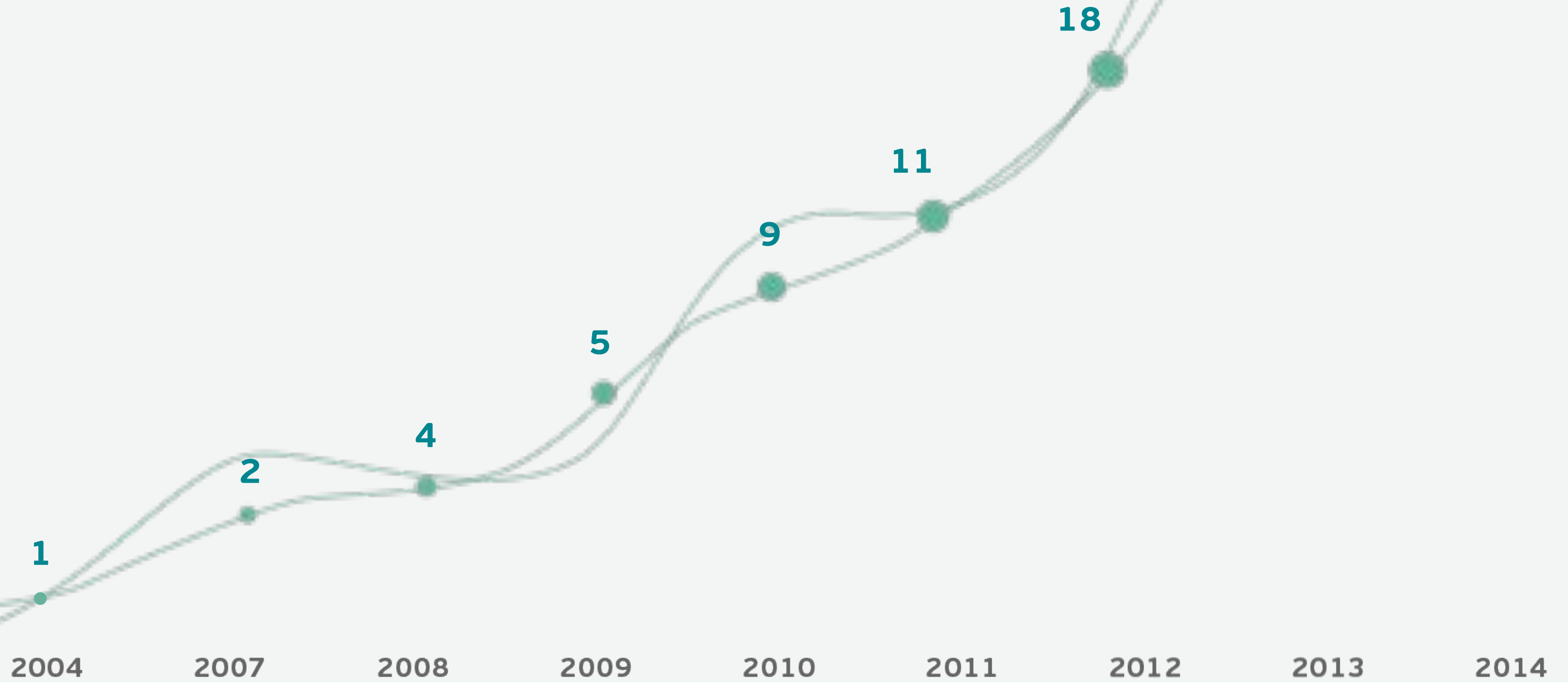
**SHAPING
THE GLOBAL
SCENARIO**

PORTFOLIO

The background features several overlapping, wavy lines in shades of teal and yellow-green, creating a dynamic, abstract pattern that flows across the bottom half of the page.

EMBRACO

R-290 COMPRESSOR MODELS RELEASED IN 60HZ



REFRIGERANT R-290

FREQUENCY 60Hz

MODEL	HP	VOLTAGE FREQUENCY	CUIN	CC	MOTOR TYPE	ARI 540 COOLING CAPACITY (Btu/h)	ARI 540 EFFICIENCY (Btu/hWh)	AVAILABILITY
EM2X1121U	1/4+	115-127 V 60 Hz 1 -	0,34	5,5	CSCR	942	5,39	production
EM2X1121U	1/4+	220 V 60 Hz 1 -	0,34	5,5	RSCR	928	5,12	production
EM2X1125U	1/4+	115-127 V 60 Hz 1 -	0,37	6,1	CSCR	1048	5,26	production
EM2X1125U	1/4+	220 V 60 Hz 1 -	0,37	6,1	RSCR	1044	5,12	production
NEK2134U	1/2	115V 60Hz 1-	0,61	10	CSR	1415	3,75	production
NEK2150U	1/2	115V 60Hz 1-	0,83	13,54	CSR	1876	3,48	production
NEK2150U	1/2	115V 60Hz 1-	0,83	13,54	CSR	1889	3,78	production
NT2160UV	3/4	115V 60Hz 1-	1,06	17,4	CSR	2176	3,75	production
NT2160UVI	3/4	208-230V 60Hz 1-	1,06	17,4	CSR	2060	3,41	production
NT2170UV	3/4	115V 60Hz 1-	1,25	20,44	CSR	2632	3,82	production
NT2170UVI	3/4	208-230V 60Hz 1-	1,25	20,44	CSR	2292	3,34	production
NT2180UV	1	115V 60Hz 1-	1,37	22,4	CSR	2840	3,81	production
NT2180UV	1	208-230V 60Hz 1-	1,37	22,4	CSR	2832	3,82	production
NT2210UV	1 1/4	115V 60Hz 1-	1,70	27,8	CSR	3614	3,77	production
NT2210UV	1 1/4	208-230V 60Hz 1-	1,70	27,8	CSR	3584	3,83	production

LBP

REFRIGERANT R-290

FREQUENCY 60Hz

MODEL	HP	VOLTAGE FREQUENCY	CUIN	CC	MOTOR TYPE	ARI 540 COOLING CAPACITY [BTU/h]	ARI 540 EFFICIENCY [EER/WH]	AVAILABILITY
EM50UER	1/6	115-127 V 60 Hz 1 -	0,18	3	RSIR-CSIR	468	4,23	production
EM50UER	1/6	220-240 V 50-60 Hz 1 -	0,18	3	RSIR-CSIR	468	4,20	production
EM70UER	1/5	115-127 V 60 Hz 1 -	2,50	4,1	RSIR-CSIR	635	4,06	production
EM70UER	1/5	220-240 V 50-60 Hz 1 -	2,50	4,1	RSIR-CSIR	635	4,06	production
EM90UEX	1/4+	115-127 V 60 Hz 1 -	2,50	4,1	CSIR	805	4,09	production
EM90UEX	1/4+	220 V 60 Hz 1 -	2,50	4,1	CSIR	860	4,33	production
FFU130UAX	1/3+	115 V 60 Hz 1 -	4,15	6,8	CSIR	1177	4,50	production
FFU130UAX	1/3+	115-127 V 60 Hz 1 -	4,15	6,8	CSIR	1177	4,50	production
FFU130UAX	1/3+	220-240 V 50-60 Hz 1 -	4,15	6,8	CSIR	1170	4,78	production
FFU160UAX	1/2	115-127 V 60 Hz 1 -	4,82	7,9	CSIR	1471	4,71	production
FFU160UAX	1/2	220 V 60 Hz 1 -	4,82	7,9	CSIR	1433	4,54	production
NE6152U	1/4	115V 60Hz 1-	0,33	5,45	CSIR	1531	5,16	production
NE6165U	1/4	115V 60Hz 1-	0,38	6,2	CSIR	1722	5,13	production
NE6210U	1/3	115V 60Hz 1-	0,54	8,75	CSIR	2447	5,47	production
NE6213U	1/2	115V 60Hz 1-	0,74	12,12	CSIR	3403	5,05	production
NE6181U	1/3	115V 60Hz 1-	0,44	7,28	CSIR	2082	6,07	samples
NE6214U	3/4	115V 60Hz 1-	0,74	12,12	CSIR	3703	5,94	samples
NE6214U	3/4	115V 60Hz 1-	0,74	12,12	CSIR	3743	6,35	samples
NT6217UV	1/2	115V 60Hz 1-	0,88	14,5	CSIR	3428	5,39	production
NT6217UV	1/2	115V 60Hz 1-	0,88	14,5	CSIR	3505	5,92	production
NT6220UV	3/4	115V 60Hz 1-	1,06	17,4	CSIR	4625	6,27	production
NT6222UV	1	115V 60Hz 1-	1,25	20,44	CSIR	5192	6,10	production
NT6224UV	1 1/4	208-230V 60Hz 1-	1,37	22,4	CSIR	5949	5,83	production

L/MBP

MBP

REFRIGERANT R-290

FREQUENCY 50Hz

MODEL	HP	VOLTAGE FREQUENCY	CUIN	CC	MOTOR TYPE	ASHRAE COOLING CAPACITY BTU/H	ASHRAE EFFICIENCY BTU/W·H	AVAILABILITY
EM2X1121U	1/4+	220-240V 50Hz 1-	0,34	5,5	CSCR	904	6,07	production
EM2X1121U	1/4+	220-240V 50Hz 1-	0,34	5,5	RSCR	904	6,07	production
EM2X1125U	1/4+	220-240V 50Hz 1-	0,37	6,1	CSCR	1031	6,02	production
EM2X1125U	1/4+	220-240V 50Hz 1-	0,37	6,1	RSCR	1031	6,02	production
EMT2117U	1/5	220-240V 50Hz 1-	0,24	3,97	CSIR	628	4,68	production
EMT2121U	1/4	220-240V 50Hz 1-	0,34	5,57	CSIR	904	4,98	production
EMT1121U	1/4	220-240V 50Hz 1-	0,34	5,57	RSCR	921	5,29	production
EMT2125U	1/3	220-240V 50Hz 1-	0,36	5,96	CSIR	1027	5,02	production
EMT1125U	1/3	220-240V 50Hz 1-	0,36	5,96	RSCR	1027	5,22	production
EMT2130U	1/3	220-240V 50Hz 1-	0,41	6,76	CSIR	1160	4,85	production
EMT1117U	1/5	220-240V 50Hz 1-	0,27	4,5	RSCR	710	5,02	production
EMT1130U	1/3+	220-240V 50Hz 1-	0,41	6,76	RSCR	1160	5,15	production
EMTE2134U	1/2	220-240V 50Hz 1-	0,58	9,5	CSIR	1478	4,81	production
NEK2117U	1/5	220-240V 50Hz 1-	0,28	4,52	CSIR	642	4,06	production
NEK2121U	1/4	220-240V 50Hz 1-	0,38	6,2	CSIR	843	4,06	production
NEK1121U	1/4	220-240V 50Hz 1-	0,38	6,2	RSIR	938	4,50	production
NEK2125U	1/3	220-240V 50Hz 1-	0,44	7,28	CSIR	1082	4,47	production
NEK2134U	1/2	220-240V 50Hz 1-	0,61	10	CSIR	1532	4,64	production
NEK2150U	1/2	220-240V 50Hz 1-	0,83	13,54	CSIR	1986	4,47	production
NEK1150U	1/2	220-240V 50Hz 1-	0,83	13,54	RSIR	1949	4,16	production
NEK2160U	3/4	220-240V 50Hz 1-	1,02	16,8	CSR	2488	4,91	production
NEU2155U	3/4	220-240V 50Hz 1-	0,83	13,54	CSIR	2136	4,85	production
NEU2159U	3/4	220-240V 50Hz 1-	0,83	13,54	CSR	2181	5,32	production
NEU2168U	3/4	220-240V 50Hz 1-	1,02	16,8	CSR	2689	5,22	production

LBP



REFRIGERANT R-290

FREQUENCY 50Hz

MODEL	HP	VOLTAGE FREQUENCY	CUIN	CC	MOTOR TYPE	ASHRAE COOLING CAPACITY (BTU/h)	ASHRAE EFFICIENCY (BTU/hWh)	AVAILABILITY
NT2160U	3/4	220-240V 50Hz 1-	1,06	17,4	CSR	2399	4,54	production
NT2160U	3/4	220-240V 50Hz 1-	1,06	17,4	CSR	2399	4,91	production
NT2170U	3/4	220-240V 50Hz 1-	1,24	20,4	CSR	2785	4,47	production
NT2170U	3/4	220-240V 50Hz 1-	1,24	20,4	CSR	2836	4,91	production
NT2180U	1	220-240V 50Hz 1-	1,37	22,4	CSR	3177	4,57	production
NT2180U	1	220-240V 50Hz 1-	1,37	22,4	CSR	3191	4,58	production
NT2210U	1 1/4	220-240V 50Hz 1-	1,70	27,8	CSR	4047	4,81	production
EM50UER	1/6	220-240 V 50-60 Hz 1 -	0,18	3	RSIR-CSR	522	4,54	production
EM70UER	1/5	220-240 V 50-60 Hz 1 -	0,25	4,1	RSIR-CSR	717	4,44	production
EM90UEX	1/4+	220-240V 50Hz 1-	0,25	4,1	CSR	945	4,68	production
FFU130UAX	1/3+	220-240 V 50-60 Hz 1 -	0,41	6,8	CSR	1362	5,29	production
FFU160UAX	1/2	220-240V 50Hz 1-	0,48	7,9	CSR	1669	5,26	production
EMT6144U	1/5	220-240V 50Hz 1-	0,27	4,5	CSR	2102	8,94	production
EMT6152U	1/4	220-240V 50Hz 1-	0,32	5,2	CSR	2532	9,15	production
EMT6165U	1/4	220-240V 50Hz 1-	0,36	5,96	CSR	2866	8,77	production
EMT6181U	1/3	220-240V 50Hz 1-	0,46	7,55	CSR	3406	9,11	production

LBP

L/MBP

MBP

REFRIGERANT R-290

FREQUENCY 50Hz

MODEL	HP	VOLTAGE FREQUENCY	CUIN	CC	MOTOR TYPE	ASHRAE COOLING CAPACITY (BTU/h)	ASHRAE EFFICIENCY (BTU/hWh)	AVAILABILITY
NEK6152U	1/4	220-240V 50Hz 1-	0,33	5,45	CSR	2491	8,70	production
NEK6165U	1/4	220-240V 50Hz 1-	0,38	6,2	CSR	2863	8,33	production
NEK6181U	1/3	220-240V 50Hz 1-	0,44	7,26	CSR	3238	8,39	production
NEK6210U	1/3	220-240V 50Hz 1-	0,54	8,78	CSR	3989	8,70	production
NEK6213U	1/2	220-240V 50Hz 1-	0,74	12,12	CSR	5412	7,81	production
NEK6217U	1/2	220-240V 50Hz 1-	0,87	14,3	CSR	6211	7,54	production
NEK6217U	3/4	220-240V 50Hz 1-	0,87	14,3	CSR	6433	8,67	production
NEU6210U	1/3	220-240V 50Hz 1-	0,54	8,78	CSR	4146	9,08	production
NEU6214U	3/4	220-240V 50Hz 1-	0,74	12,12	CSR	5614	8,43	production
NEU6214U	3/4	220-240V 50Hz 1-	0,74	12,12	CSR	5740	9,38	production
NEU6217U	3/4	220-240V 50Hz 1-	0,87	14,3	CSR	6498	8,02	production
NEU6217U	3/4	220-240V 50Hz 1-	0,87	14,3	CSR	6712	9,42	production
NT6217U	1/2	220-240V 50Hz 1-	0,88	14,5	CSR	6095	8,80	production
NT6220U	3/4	220-240V 50Hz 1-	1,06	17,4	CSR	7514	8,36	production
NT6220U	3/4	220-240V 50Hz 1-	1,06	17,4	CSR	7678	9,52	production
NT6222U	3/4	220-240V 50Hz 1-	1,24	20,4	CSR	8657	8,09	production
NT6222U	1	220-240V 50Hz 1-	1,24	20,4	CSR	8992	9,45	production
NT6224U	1	220-240V 50Hz 1-	1,37	22,4	CSR	9702	9,32	production
NT6230U	1 1/4	220-240V 50Hz 1-	1,70	27,8	CSR	12300	9,0	samples

MBP



embraco

POWER IN.
CHANGE ON.