



solutions for europe

natural refrigerants

16-17 March 2015 in Brussels

Johnson Controls

John Burden

Garry Shaw

Energy Optimisation and Refrigeration

Who we are

Automotive Experience



A global leader in automotive seating, overhead systems, floor consoles, door panels and instrument panels.

Building Efficiency



Delivering technologies and services that increase efficiency and lower operational and energy costs in buildings.

Global WorkPlace Solutions



Creating workplaces that help people and businesses thrive.

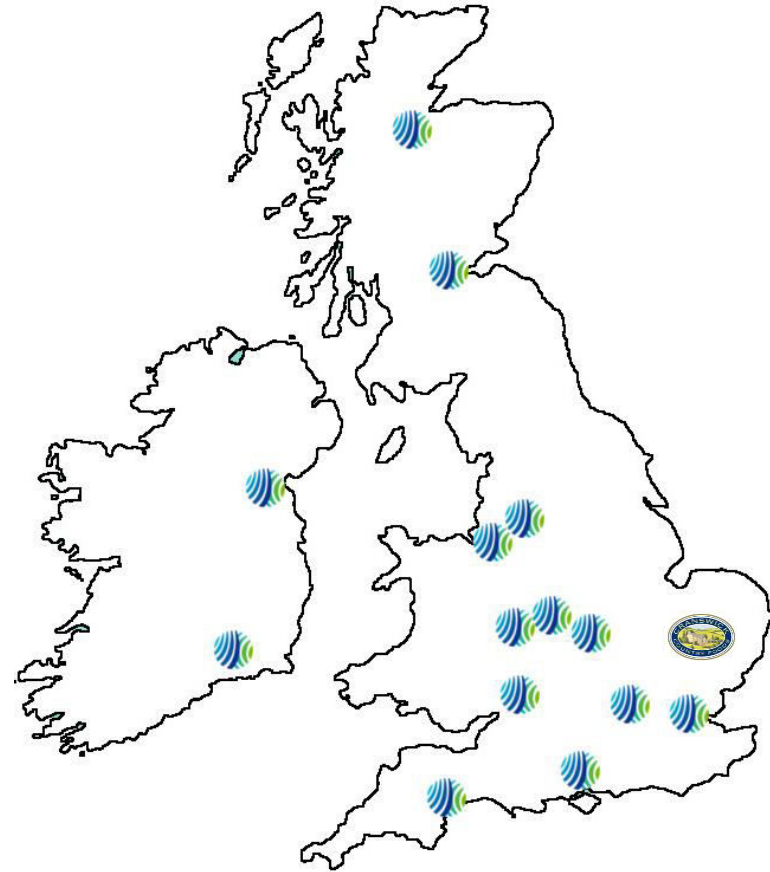
Power Solutions



The world's largest manufacturer of automotive batteries, powering nearly every type of vehicle.

The Client – Cranswick PLC

- Major supermarket supplier of mainly pork products, trading in the meat sector since 1988
- 14 UK processing & manufacturing sites
- 7,000 people
- Annual turnover €1.3b
- Tender process for Norfolk site
- January 2012 to November 2013
- Multiple bidders



Key Drivers

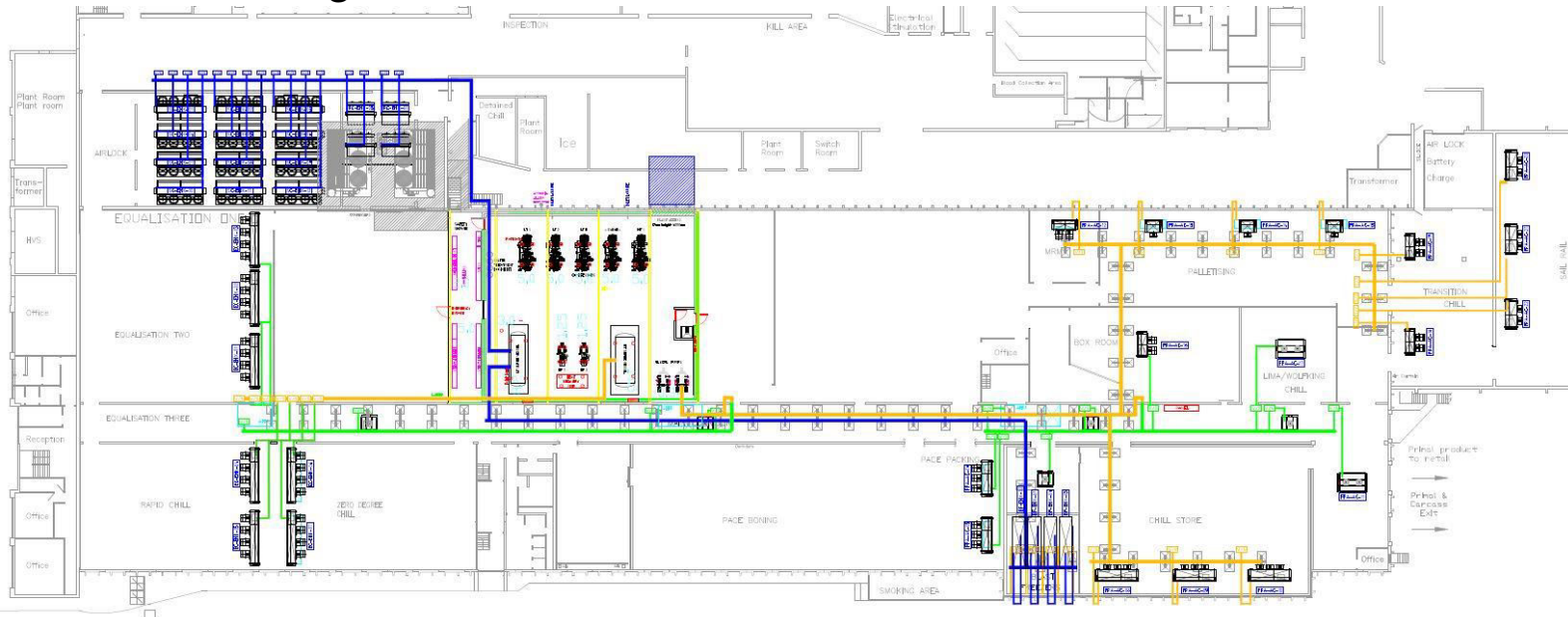
- Utility reductions- Oil, Gas, Electricity
- Reduce Carbon Footprint (CRC)
- R22 phase out and HFC refrigerant dependency
- Improve product yield
- Overall asset integrity



Application

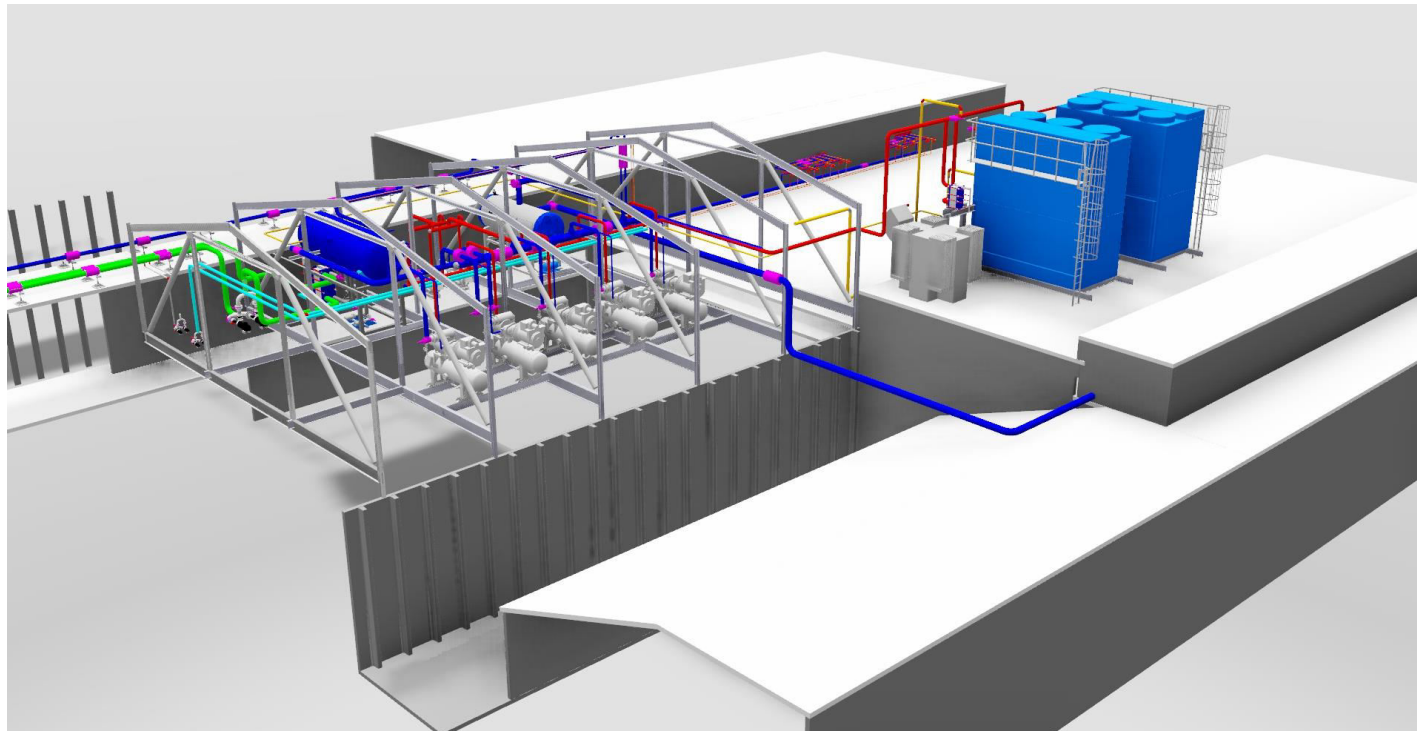
Four stage Ammonia/Glycol system

- Low temperature Ammonia @ -33 degC x 1,700kW
 - Medium temperature Ammonia @ -12 degC x 600kW
 - Secondary water/glycol @ -8 degC x 1,000kW
 - High temperature heat pump @ +60 degC x 950kW
-
- Cooling COP (LT) 2.3
 - Cooling COP (HT) 3.9
 - Heating COP 14



Products

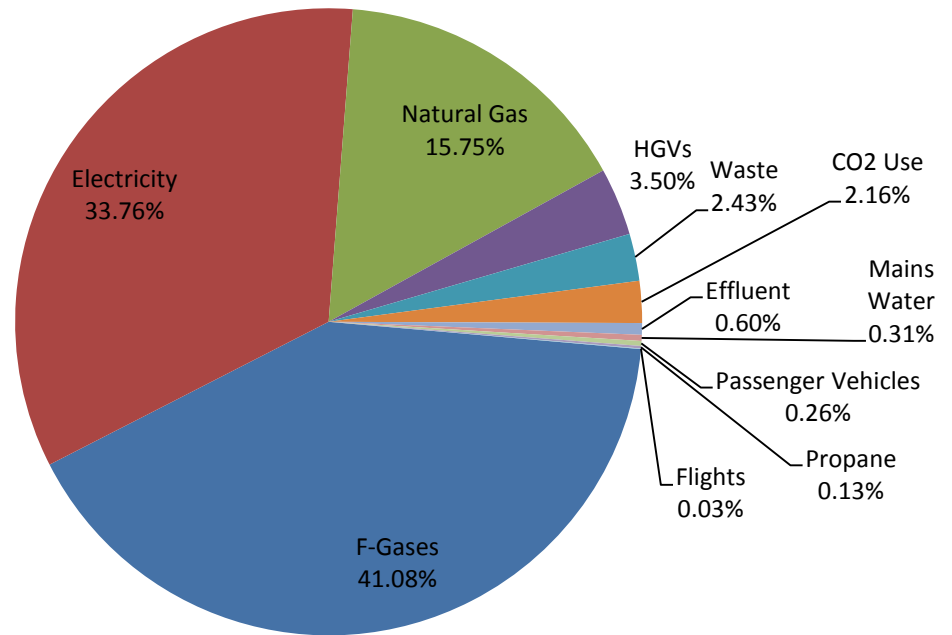
- Five frequency driven SABROE screw compressors
- Two frequency driven SABROE heat pump compressors
- Heat recovery system
- Sixty five Air coolers with EC frequency driven fans
- Nine frequency driven distribution pumps
- Two frequency driven evaporative condensers
- ISAC[®] optimised Johnson Controls SCADA control system



Knowledge Share

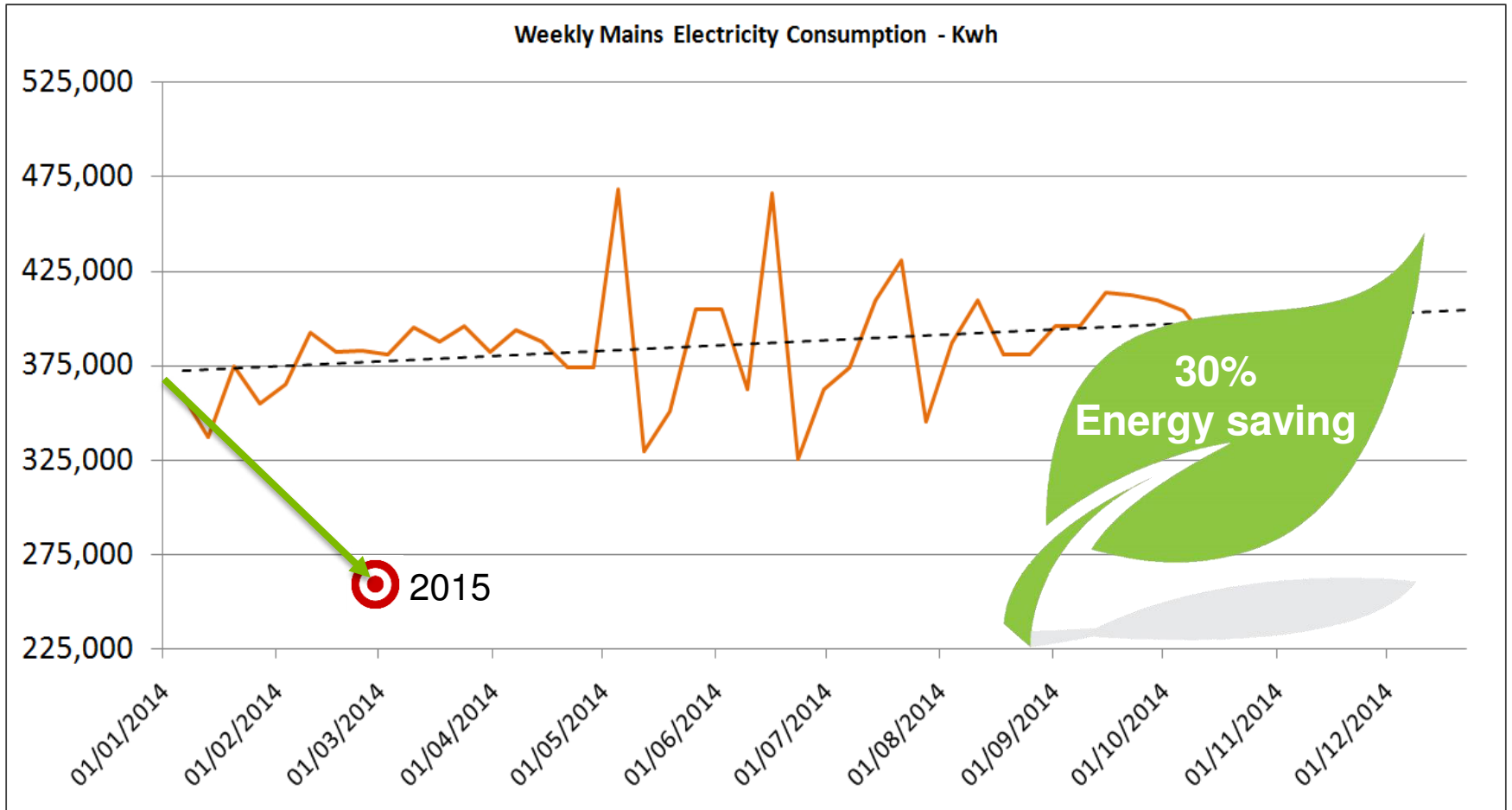
Source	Tonnes CO ₂ e	%	CRC Cost
F-Gases	9,651.00	41.08%	€ 150,555.60
Electricity	7,931.26	33.76%	€ 123,727.65
Natural Gas	3,699.26	15.75%	€ 57,708.40
HGVs	821.43	3.50%	€ 12,814.29
Waste	570.74	2.43%	€ 8,903.50
Effluent	140.80	0.60%	€ 2,196.46
Mains Water	73.34	0.31%	€ 1,144.17
Passenger Vehicles	60.09	0.26%	€ 937.41
Propane	30.11	0.13%	€ 469.69
Flights	7.06	0.03%	€ 110.10
	23,491.68		€ 358,567.28

Carbon Footprint Contribution By Source



Carbon Reduction Commitment Energy Efficiency Scheme (CRC)

Knowledge Share



Summary

- | | |
|----------------------------------|-------------------|
| ▪ Electrical energy | Reduced by 30% |
| ▪ Gas usage | Reduced by 30% |
| ▪ Oil usage | Reduced to Zero |
| ▪ Water usage | Reduced by 10% |
| ▪ Tonnes CO ₂ e (CRC) | Reduced by 45% |
| ▪ Product yield reduction | > €1.3m per annum |
| ▪ Overall operation gain | > €2.6m per annum |

Barry Lock -Site Director

“Cranswick Country Foods Norfolk has worked closely with Johnson Controls to provide an innovative cooling solution that is targeted to deliver industry leading performance. Johnson Controls honesty and experience has enabled Cranswick Country Foods to trust them in the delivery of targeted energy savings. This, along with the high degree of professionalism that has been shown from the initial design stage, will leave Cranswick Country Foods Norfolk with an installation to be proud of ”



Thank you

ANY QUESTIONS?

www.johnsoncontrols.com



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