Cut Costs & Carbon Calculator – Launch Event

Delivering lifecycle economic & environmental benefits across the whole value chain of the catering industry

26 June 2013

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- Background context
- The opportunity
- The challenge
- The solution
- A worked example
- Summary of business benefits
- Next steps

The opportunity

The opportunity…

The UK catering industry – and replicable globally…

In the UK: >8 billion meals across 260,000 sites

TODAY

- Energy costs:
  - **>£770m/yr**
- Carbon emissions:
  - 3.9mtCO2/yr
  - 2% of UK business & public sector emissions
- Costs per meal:
  - Depending on business type & size, equivalent to **10-20p per meal**

30% savings achievable

TOMORROW

- Energy Costs reductions:
  - **>£250m/yr**
- Carbon emission reductions:
  - >1mtCO2/yr
- Savings per meal:
  - **3-6p per meal**

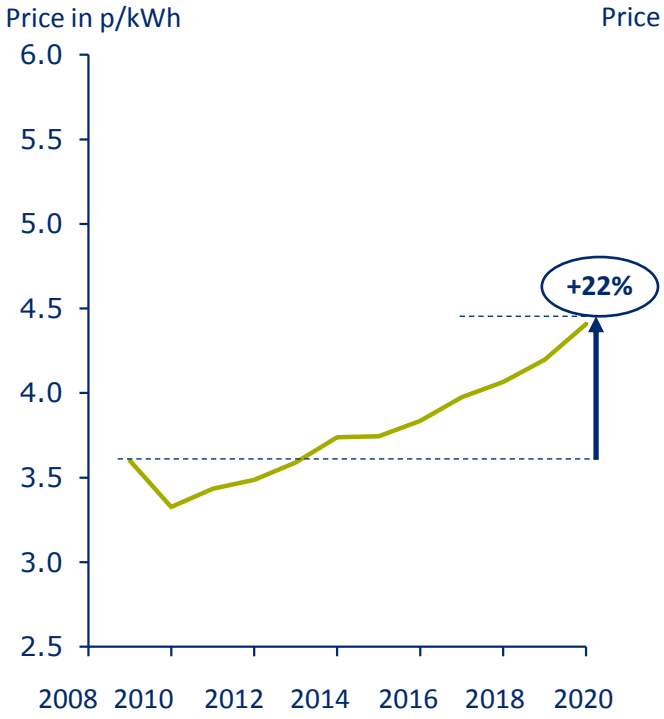
Source: BHA Trends & Statistics 2012 and Carbon Trust analysis

The challenge

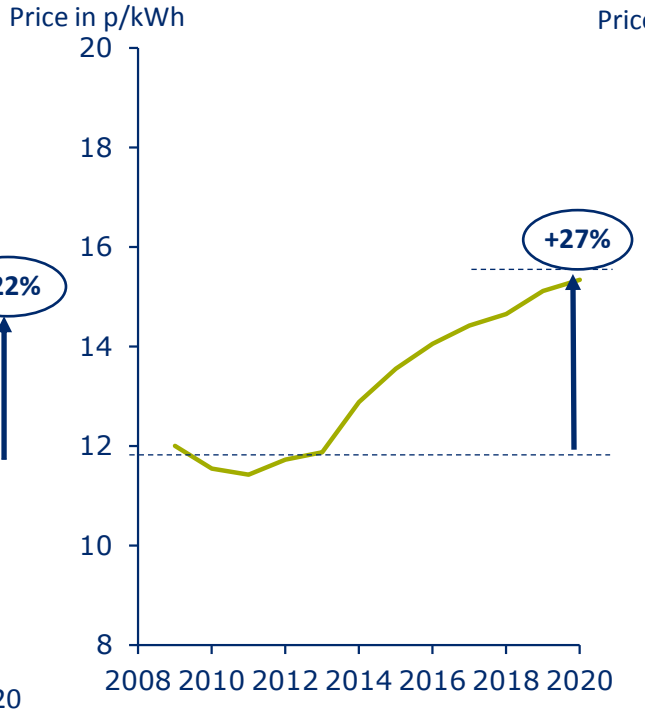
The challenge…

Energy prices are set to continue to rise by >20%, to >£1bn/yr by 2020

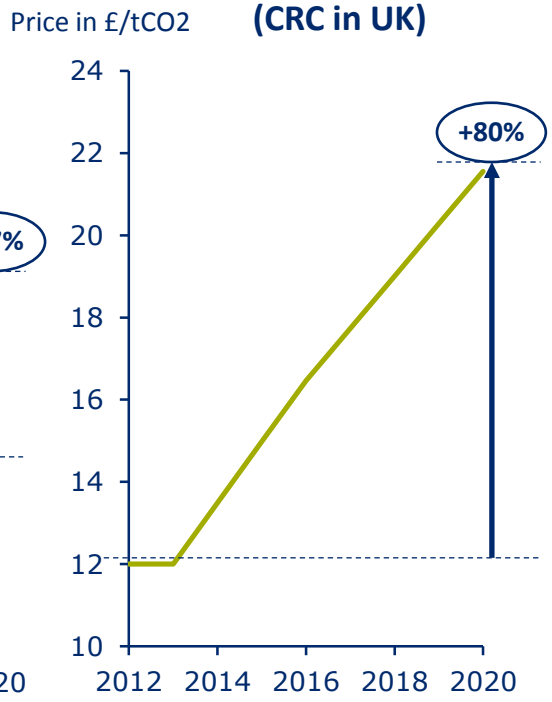
Gas



Electricity



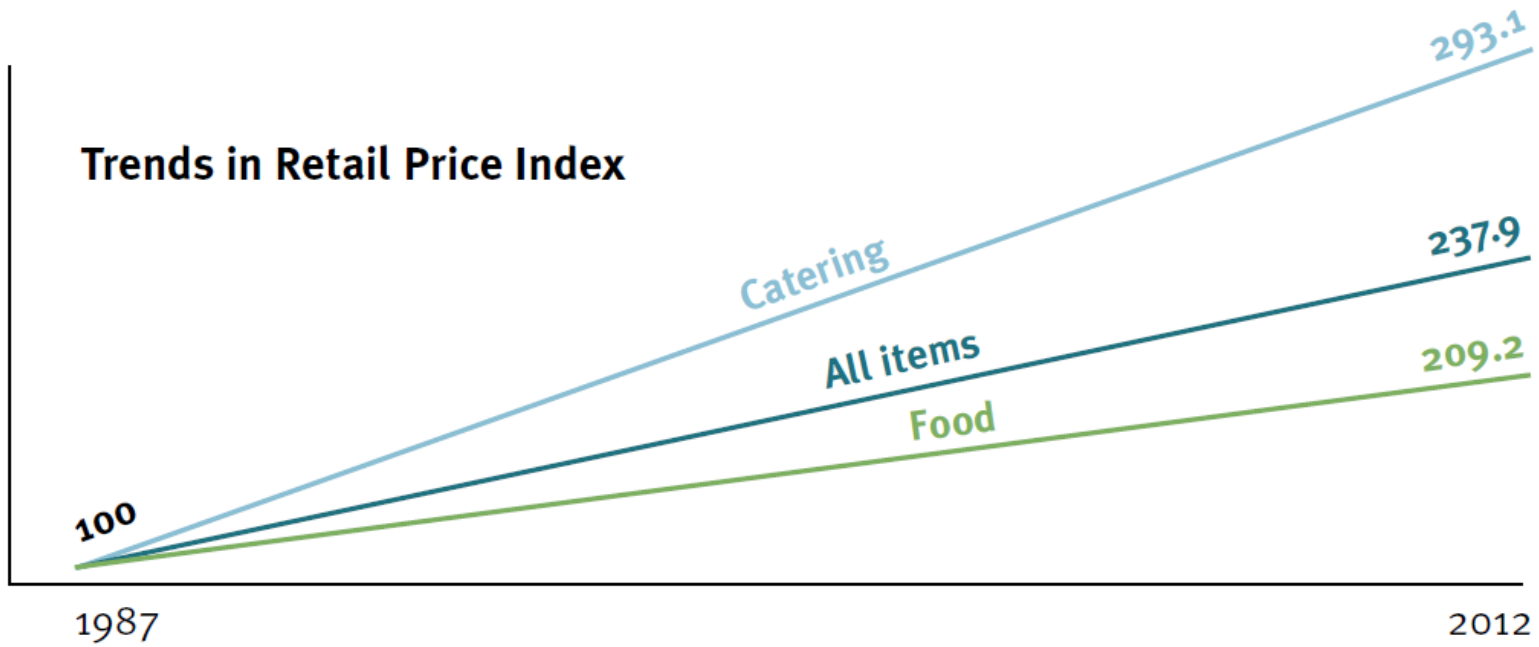
Carbon (CRC in UK)



Source: OFGEM Energy Market Scenarios Project Discovery; Carbon Trust analysis

The challenge…

And its not only energy prices that are growing…



Source: BHA Trends & Statistics 2012

Business benefits…

Barriers and drivers for energy efficiency are diverse and interconnected

	Behaviour & motivation	Misaligned incentives	Hidden costs & benefits	Financial costs & benefits
BARRIERS	› Perceived relative immateriality of energy costs › Out of date decision making processes e.g. rules of thumb	› Misalignment between key departments e.g. Procurement & Operations	› Lack of internal resources & tools to identify & implement opportunities	› Upfront investment
DRIVERS	› Training encourages existing champions across organisation who are ready to set an example	› Emissions from use of catering equipment are currently unregulated	› Enhanced reputation with employees & consumers	› Energy cost savings › CRC savings › Access to finance for equipment

The solution

The catering industry has a problem …

Low cost/carbon catering exists:

- Efficient equipment
- Efficient operating models

Operators are feeling the pain:

- Energy cost rises are hurting
- Operators know in-use costs are the majority lifetime factor
- and they know their employees leave things switched on

Despite this:

- Operators are buying cheap CapEx, expensive to run equipment
- Using it inefficiently

… a problem which can be solved … by us

Producers need a definitive, recognised tool, they can put in front of customers which shows cost and carbon impacts of choices

We are overcoming the disconnect between aspirations and actions:

- We used access to experts across the industry helped by CESA
- And obtained seed funding from DEFRA
- Our Triumvirate: Dominic Burbridge, Philippe Pernstich and myself

What the tool does

Inputs

Combines 3 axes of information (defined via parameters):

- A profile of the demands on a commercial kitchen
- Selected set of kitchen equipment
- Different operating models (planned and behavioural)

Outputs

- The energy, cost and carbon impacts of any combination
- To compare with other scenarios

Benefits

- Provides a definitive tool for optimising new kitchens to needs
- Validation of expected savings versus alternative scenarios
- Shows scenario impacts of running kitchen in different ways

Building such a model requires:

NUMBERS

Embodied: Mass and Type
In Use: Energy Data
Capacities, lifetimes etc

PEOPLE

Cross-functional experts
Process maps
What happens if…

MODEL

Capturing the above to the right level of detail

Simple on the outside, very complex on the inside

Building such a model requires:
Numbers – Derived from a wide range of sources

- Carbon Trust's Industrial Energy Efficiency Accelerator: Contract Catering Sector Guide
- Preparatory Study for Eco-design Requirements for EuPs:
  - Lot 1: Refrigerating and Freezing Equipment
  - Lot 22: Commercial and Domestic Ovens
  - Lot 23: Domestic and Commercial Hobs and Grills
  - Lot 24: Professional Washing Machines, Dryers and Dishwashers
- Rohatsch et.al. (2007) Professional Kitchens: Planning, Design, Equipment. FCSI/Huss, Berlin
- Equipment specification sheets

Building such a model requires:
People – Cross-functional experts

- Maggie Charnley, DEFRA
- Kiko Moraiz, DECC
- Paddy Howlin, GPS
- David Wharton, GPS
- Keith Warren, CESA
- Glenn Roberts, CESA/GRAM UK
- Mick Shaddock, CESA/Victor manufacturing
- Stephen Elliott, CESA/Serviceline.uk
- Mike Mellor, CESA/Space catering
- Iain Munro, CEDA/ScoMac
- Jack Sharkey, CEDA/ Vision
- Vic Laws, FCSI
- David Bentley, FCSI/Russell Partnership
- Chris Wright, CaterQuotes
- David Clarke, CDIS-KARM
- Camilla Woods, BHA

So you end up with a tool which shows you…

Catering Cost/Carbon Calculator

Establishment Input | Demand Input | Menu and Operation | Equipment | Results

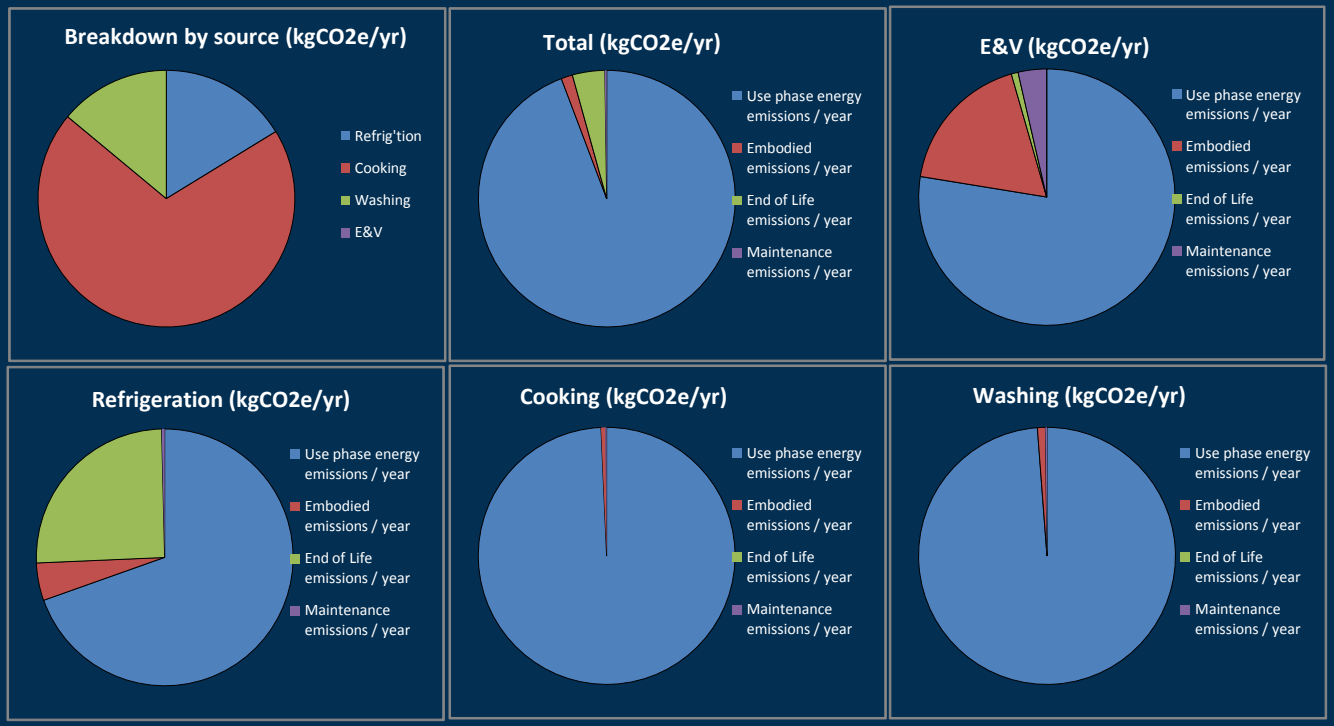
Results

- Carbon Emissions Summary
- Cost Summary
- Energy Summary

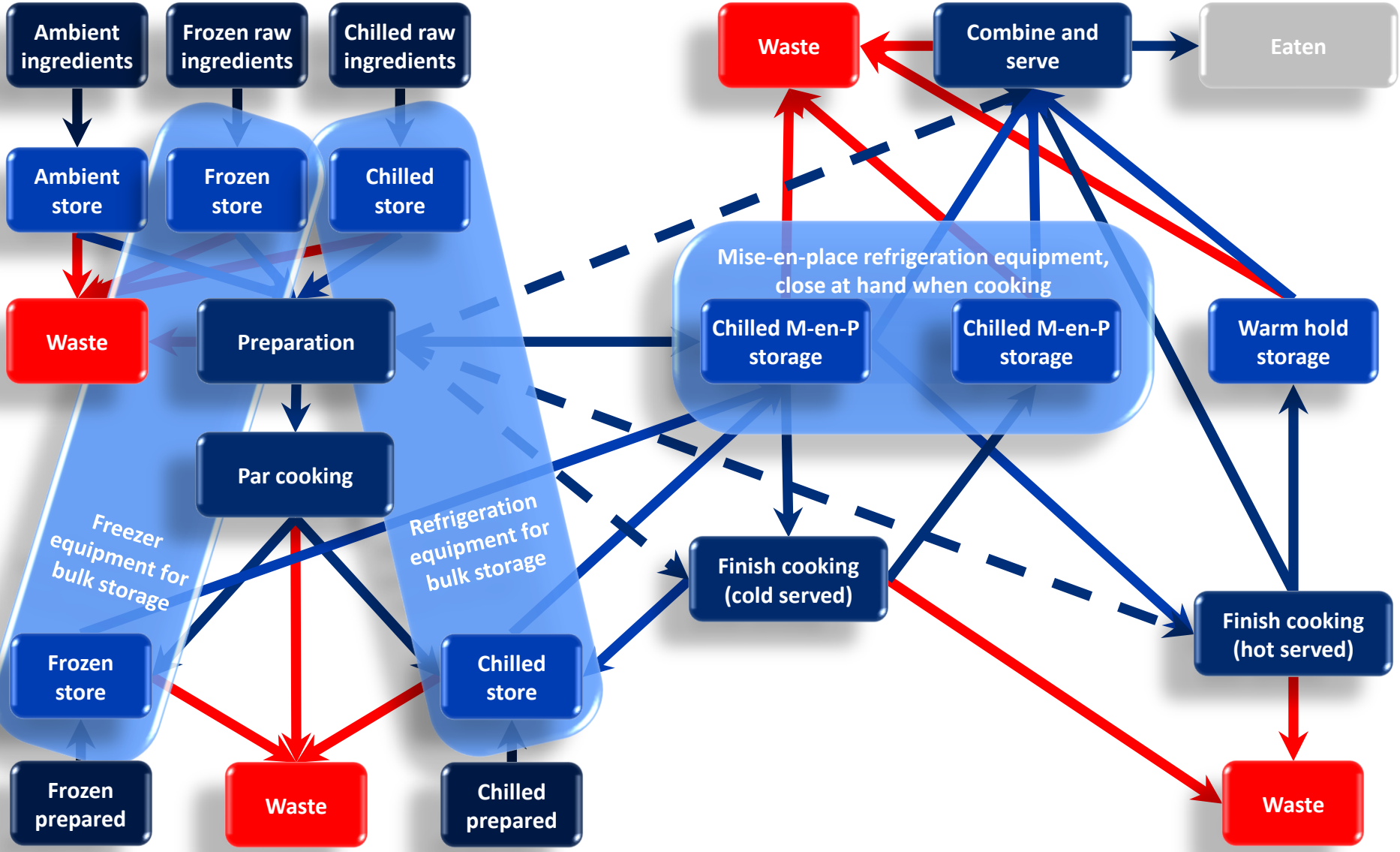
- Refrigeration Results
- Cooking Results
- Ware washing Results
- Extraction & Ventilation Results

- Cooking Strategy Comparisons

Summary Overview



To get there needs lots of process mapping



Defaults to remove complexity… then increasing detail

Catering Cost/Carbon Calculator

Establishment Input | Demand Input | Menu and Operation | Equipment | Results

Establishment Parameters

Establishment Type: Pub

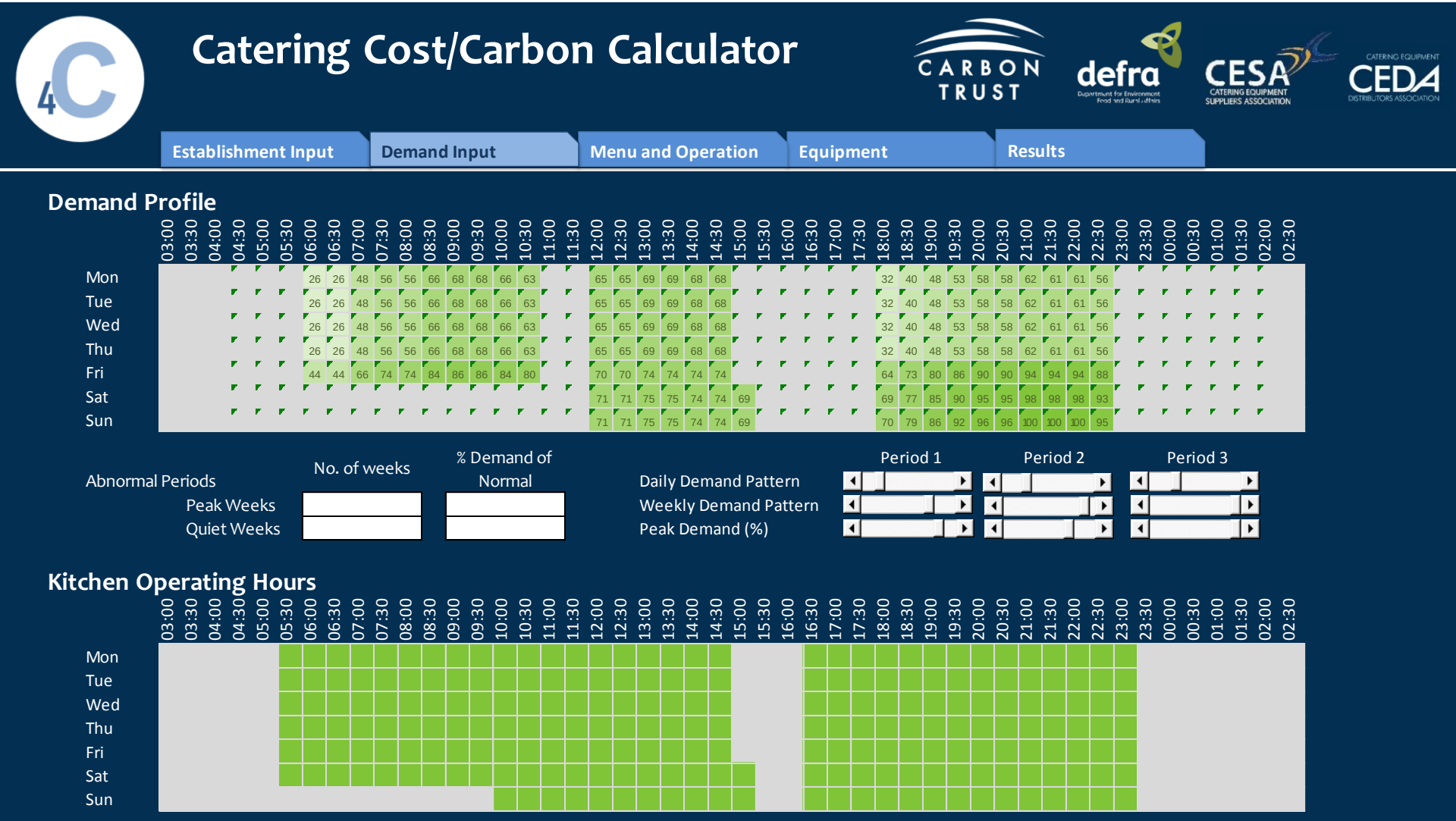
Seating Capacity: | Max. Additional Seating: | Avg. Table Turnaround: minutes

Opening Times	Open 1	Close 1	Open 2	Close 2	Open 3	Close 3
Mon	06:00	10:30	12:00	14:30	18:00	23:00
Tue	06:00	10:30	12:00	14:30	18:00	23:00
Wed	06:00	10:30	12:00	14:30	18:00	23:00
Thu	06:00	10:30	12:00	14:30	18:00	23:00
Fri	06:00	10:30	12:00	14:30	18:00	23:00
Sat			12:00	15:30	18:00	23:00
Sun			12:00	15:30	18:00	23:00

Kitchen Operating Hours	Open 1	Close 1	Open 2	Close 2	Open 3	Close 3
Mon	05:30	15:00	16:30	23:30		
Tue	05:30	15:00	16:30	23:30		
Wed	05:30	15:00	16:30	23:30		
Thu	05:30	15:00	16:30	23:30		
Fri	05:30	15:00	16:30	23:30		
Sat	05:30	15:30	16:30	23:30		
Sun	10:00	15:30	16:30	23:30		

Closed Periods	Duration (Weeks)
Period 1	
Period 2	
Period 3	
Period 4	
Period 5	
Period 6	

Sliders to easily model reality… or over-ride with detail



The menu: high level

Catering Cost/Carbon Calculator

Establishment Input | Demand Input | Menu and Operation | Equipment | Results

Menu and Food Preparation

Kitchen Type

Convenience Product Input (%)

No. of Menus

Serving Window (minutes)

Typical cooking behaviour

Menu 1

Menu Type

Availability From To

Ratio of starters to main courses

Ratio of dessert to main courses

Add/Amend Meal Types

Meal Type

Mains Category	% of sales by weight

Starters Category	% of sales by weight

Dessert Category	% of sales by weight

The menu: detailed - Main courses, starters and desserts

Catering Cost/Carbon Calculator

Establishment Input | Demand Input | Menu and Operation | Equipment | Results

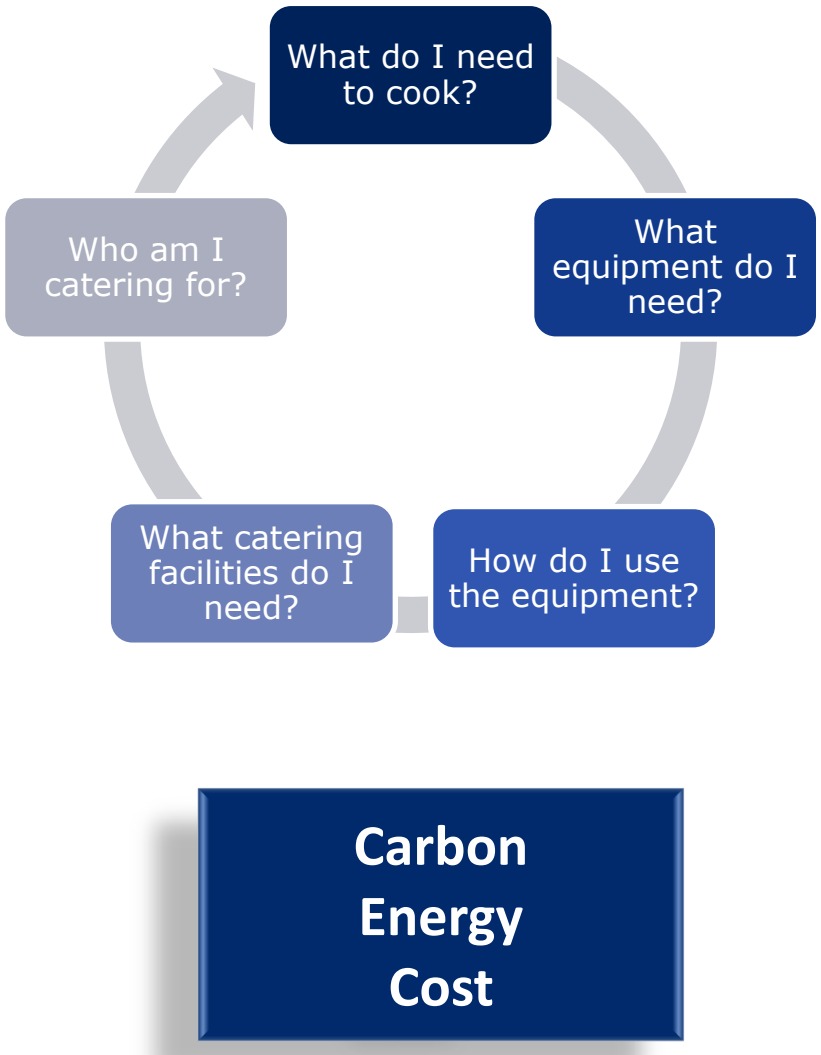
Meal Definitions

Return to Menu and Operation

Main Courses

			Preparation (per serving - raw prepped weight)																*Finish hot (per serving - raw prepped weight)*													
			Hob		Oven - heat		Oven - steam		Grill		Bratt pan		Fry		Micro-wave		Warm-ing		Hob		Oven - heat		Oven - steam		Grill		Bratt pan		Fry		Micro-wave		Warm-ing	
Name	*% of sales (by mass)*	Serve cold quantity (g)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)	Quantity (g)	Time (mins)
Grilled meat/fish, chips, vegetables	45				175	30	50	5											175	15			25	5					30	10	200	3		
Fried Fish, chips, vegetables	20																		175	10									200	15	25	3		
Roast Meat/Fish, potatoes vegetables	20		400	20															400	10														
Rice/Pasta dishes																																		
Pizza																																		
Pies/Quiches																																		
Stews																																		
Stir-fries	5				200	60															100	10			100	10			100	10	100	10		
Salads	10	250							50	10			5	3																				

What the model can do - Highlights



It can identify & quantify the impact of:

- Menu complexity
- Sizing your kitchen for average week, peak weeks or weeks with 'special weekends' etc.
- Compare kitchen designs
- 'Right-sizing' the capacity of equipment
- CapEx and OpEx of different equipment and fuel types (induction verses gas etc.)
- Different behavioural, operational and equipment optimisation strategies
- Different food delivery & storage strategies
- Different preparation cooking strategies
- Different 'hot finish' service windows
- Changing almost anything that you can think with respect to catering operations

Worked example – Restaurant business

Worked example – Restaurant business
Overview – Modelling & Comparison Scenarios

- To help demonstrate the ‘power’ of the calculator, using a worked example, we created a baseline scenario and four different reduction scenarios:
  - Baseline
  - Improved User Behaviour
  - Maximised User Efficiency
  - Menu Optimisation
  - Equipment Optimisation
- The measured lifecycle energy cost and carbon where then compared against each other
- All of the scenarios are not mutually exclusive and aspects of each one can be combined or omitted depending on the specific requirements of any business and their catering sites

Worked example – Restaurant business

Overview – Input parameters

- Business Type: **Restaurant**
- Seating Capacity: **150** Opening hours: **12-10pm**
- **Varied and complex menu** with many dishes relying on multiple components cooked on the hob

Cooking:

- 1 electric six-ring hob
- 2 range ovens
- 1 10-grid combi gas oven
- 1 counter-top convection oven
- 2 microwaves
- 1 warmer
- 1 Salamander grill
- 1 two-tank electric fryer

Refrigeration:

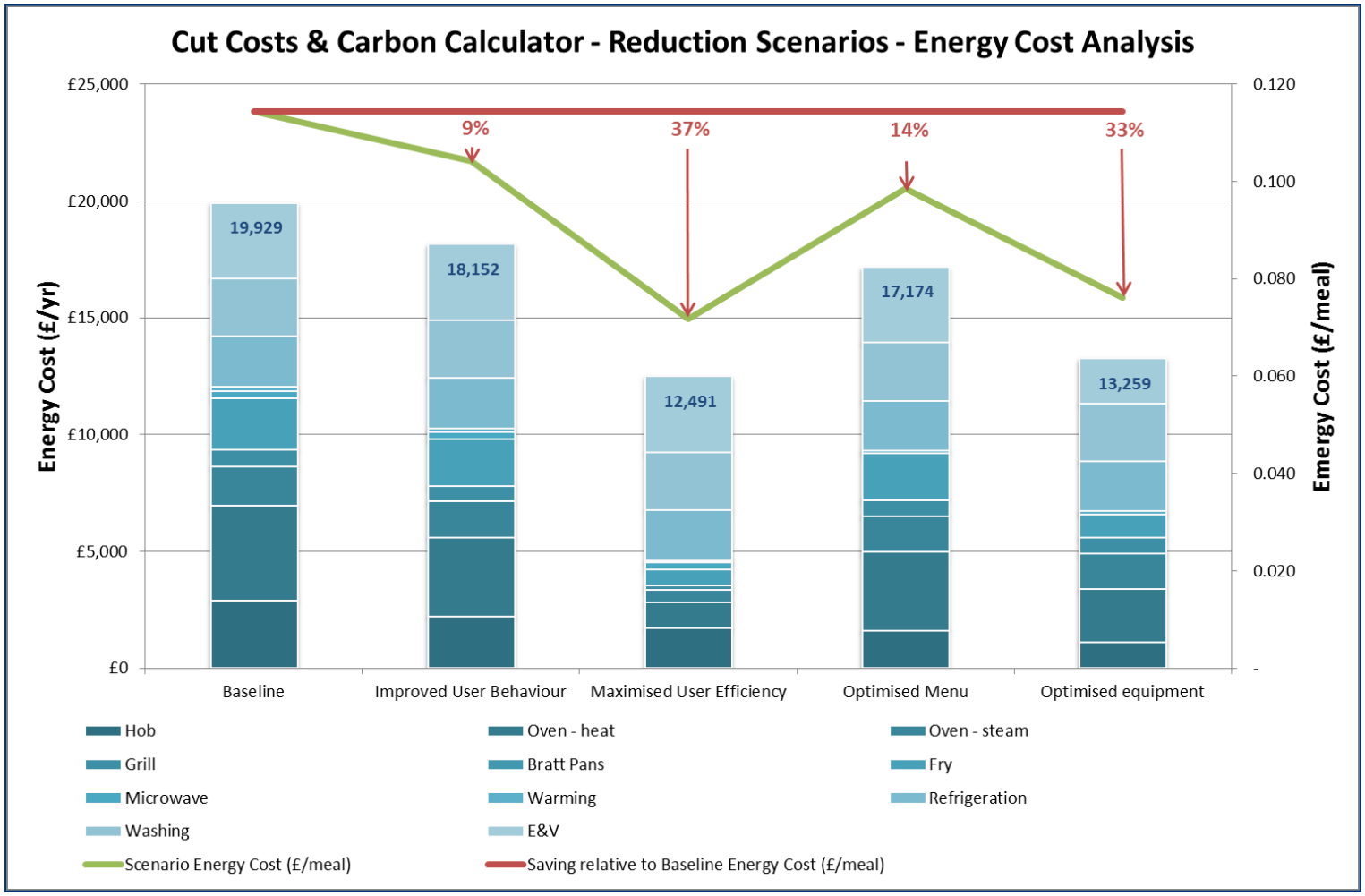
- 2 Upright fridges
- 3 under-counter fridges
- 5m2 cold room
- 1 double upright freezer
- 2 under-counter freezers
- 1 blast chiller

Washing:

- 1 glass washer
- 1 pass-through dishwasher

Worked example – Restaurant business

Overview – Calculator outputs & analysis of results

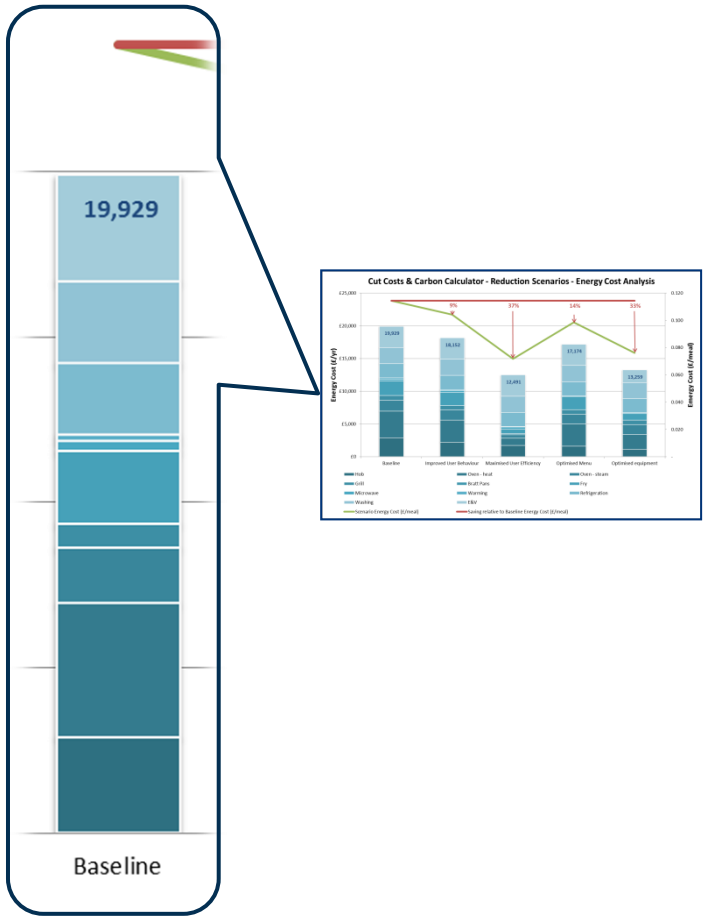


Worked example – Restaurant business

Scenario 1: Baseline

- **Baseline**
  - Developed under the direction of the Project Technical Steering Committee
  - Based on a typical menu, kitchen design and equipment selection for a 150 cover restaurant
  - This scenario calculates the cost and carbon assuming staff keep all equipment on throughout their shifts

- **Energy cost saving relative to baseline: 0%**

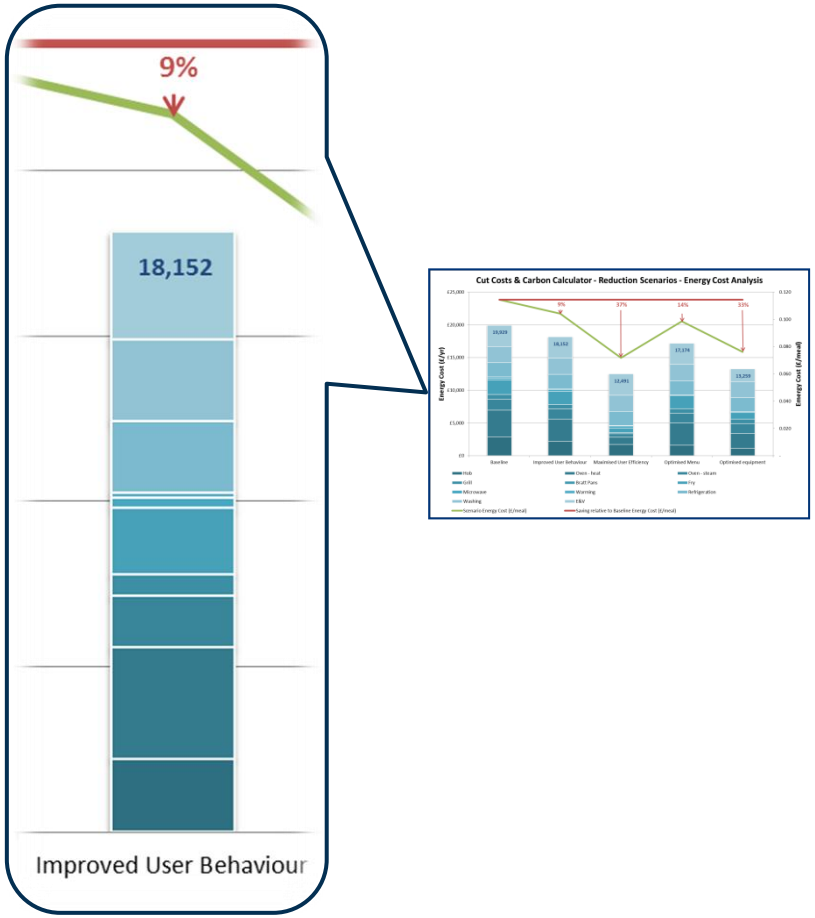


Worked example – Restaurant business

Scenario 2: Improved User Behaviour

- **Improved User Behaviour**
  - Through a combination of staff training and updated procedures, this scenario calculates the reductions assuming any unused equipment is turned off, or onto stand-by mode, during prolonged quiet periods during shifts

- **Energy cost saving relative to baseline: approx. 10%**

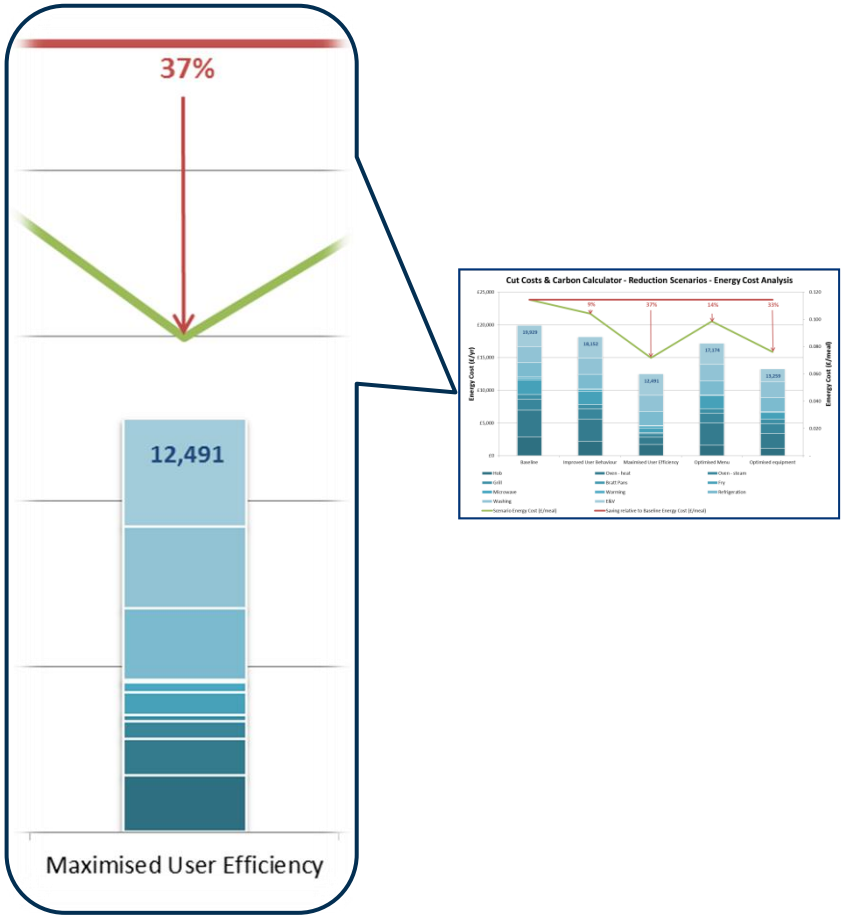


Worked example – Restaurant business

Scenario 3: Maximised User Efficiency

- **Maximised User Efficiency**
  - Through development of an ‘efficiency’ culture, strong leadership by management and committed staff, this scenario calculates the reductions assuming that appliances (particularly gas) are turned off at every reasonable opportunity

- **Energy cost saving relative to baseline: >30%**



Worked example – Restaurant business

Scenario 4: Menu Optimisation

- **Menu Optimisation**
  - This scenario builds on the 'improved user behaviour' scenario
  - It calculates the reductions assuming that, following a review of customer preferences and cooking practices, the menu has been adjusted to offer a similar or greater selection of options but using a reduced range of cooking methods for core aspects of each choice
  - The result is that the catering requirements of the menu are more closely aligned with the current range of installed catering equipment.

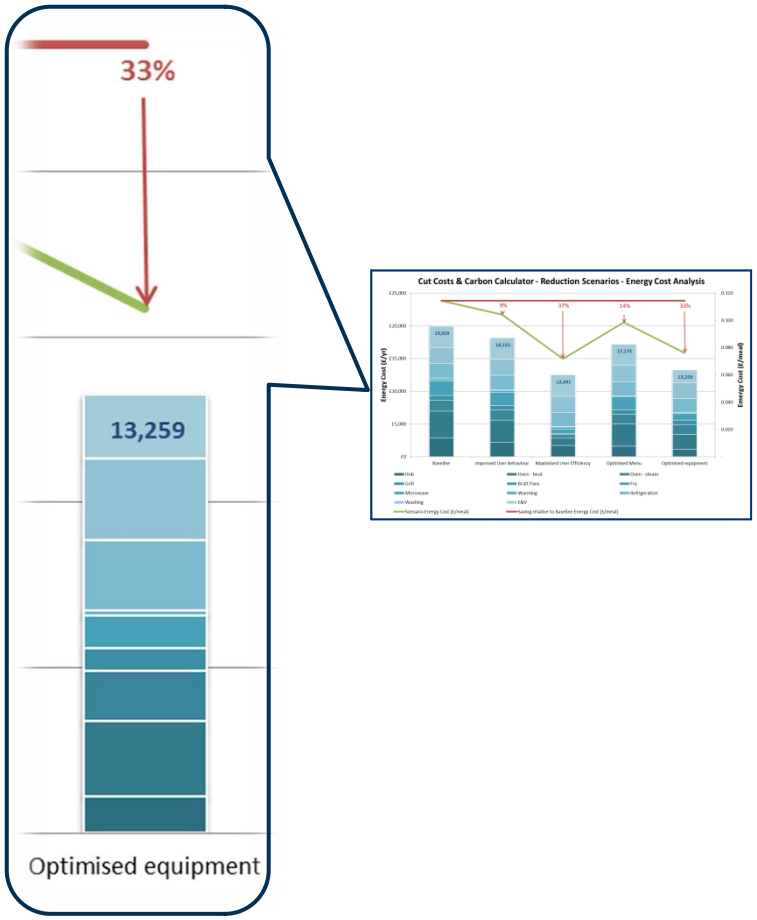
  - **Energy cost saving relative to baseline: approx. 15%**
    (5% increase from Scenario 2)

Worked example – Restaurant business

Scenario 5: Menu Optimisation

- **Equipment Optimisation**
  - This scenario builds on the 'menu optimisation' scenario
  - It calculates the reductions assuming the opportunity to optimise the installed catering equipment has been implemented e.g. switching the hob from electric to gas, removing some over-capacity (e.g. the refrigeration, the microwaves, fryer and one of the range ovens).

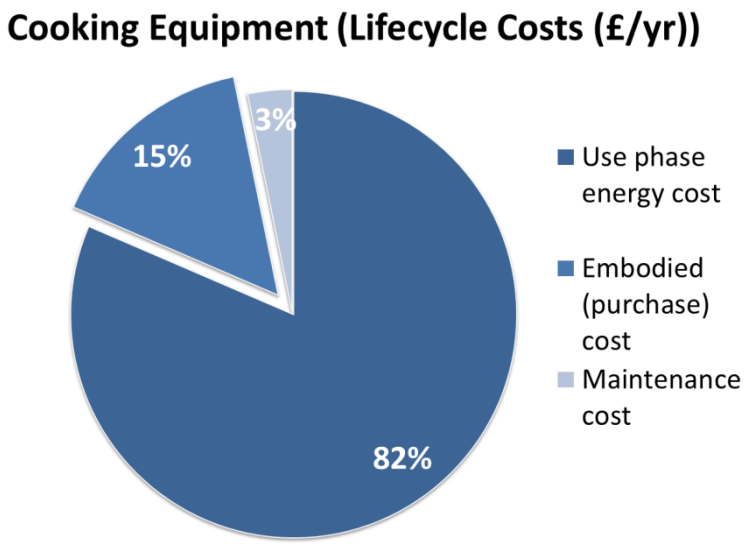
- **Energy cost saving relative to baseline: >30%**
  (>15% increase from Scenario 4)



Worked example – Restaurant business

Lifecycle costing: Results & analysis

- **Lifecycle costing:**
  - For cooking equipment 85% of lifecycle cost is associated with the energy used in operation
  - This emphasises the business case for investing in the procurement of energy efficiency catering equipment
- **Our analysis shows that, assuming you can accept a 2yr simple payback, it is cost effective to spend up to 12-25% more for equipment that can deliver a 10-20% saving compared to cheaper, inefficient equipment.**
- **Taking into account future energy price inflation (a further 20% by 2020) this reduces the simple payback by almost 3 months**



Business benefits

Business benefits

At a UK catering industry level…

>8 billion meals across 260,000 sites

TODAY

- Energy costs:
  - **>£770m/yr**
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30% savings achievable

TOMORROW

- Energy Costs reductions:
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- Carbon emission reductions:
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- Savings per meal:
  - **3-6p per meal**

Business benefits

At a business level, using the Cut Costs & Carbon Calculator can demonstrate that…

Manufacturers / Distributors	Designers	Operators
…for catering equipment, that is 10-20% more energy efficient than alternatives, assuming a simple payback of <2yrs is acceptable, then **it is affordable for your clients to spend up to 12-25% more** to be able to capitalise on these lifetime energy cost and carbon savings	…because optimisation of kitchen designs and aligning menu and equipment selection/use can delivery up to 10-20% in energy cost and carbon savings, in many circumstances, for organisations that don't have the internal resources of skills, **paying for expert advice is a cost-effective way to access these savings**	…**benchmarking and performance monitoring, of you catering operations can uncover 10-30% energy cost and carbon savings** through prioritised investment in: › Behavioural change › Menu optimisation › Kitchen design › Equipment selection › Any/or of the above

Business benefits…

The Cut Costs & Carbon Calculator removes the barriers that prevent businesses from capitalising on this opportunity…

	Behaviour & motivation	Misaligned incentives	Hidden costs & benefits	Financial costs & benefits
BARRIERS	› Perceived relative immateriality of energy costs › Out of date decision making processes e.g. rules of thumb	› Misalignment between key departments e.g. Procurement & Operations	› Lack of internal resources & tools to identify & implement opportunities	› Upfront investment
DRIVERS	THE CALCULATOR PROVIDES THE ANSWERS THAT ARE NEEDED TO CHALLENGE THE IDENTIFIED BARRIERS			

Next Steps

Next steps – Use the calculator…

We can help you unlock the commercial and environmental benefits

- We have proved the calculator can be used as a:
  - **'Benchmarking, scenario planning & comparative modelling ' tool** for the industry as a whole
  - **'Selling' tool** to help manufacturers compare their equipment against industry averages and help grow revenues and market share
  - **'Innovation' tool** to help manufacturers (and industrial designers) identify and focus R&D efforts on reducing manufacturing & 'cost of ownership' resource & energy costs and environmental impacts
  - **'Catering Design Optimisation' tool** to help designers, dealers, specifiers and even operators assess the economic and environmental efficiency of their existing and new catering facilities and operations
  - **'Menu Development & Behavioural Change' tool** to help operators uncover new ways to enhance economic and environmental sustainability of their operations whilst continuing to exceed the needs and expectations of their customers
- As a next step, we can provide the right training and advice to help your business capitalise on these opportunities

Any questions.....?

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