

# Food Waste in the Online Grocery Supply Chain: The Case of Ocado's Salads

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# Presentation structure

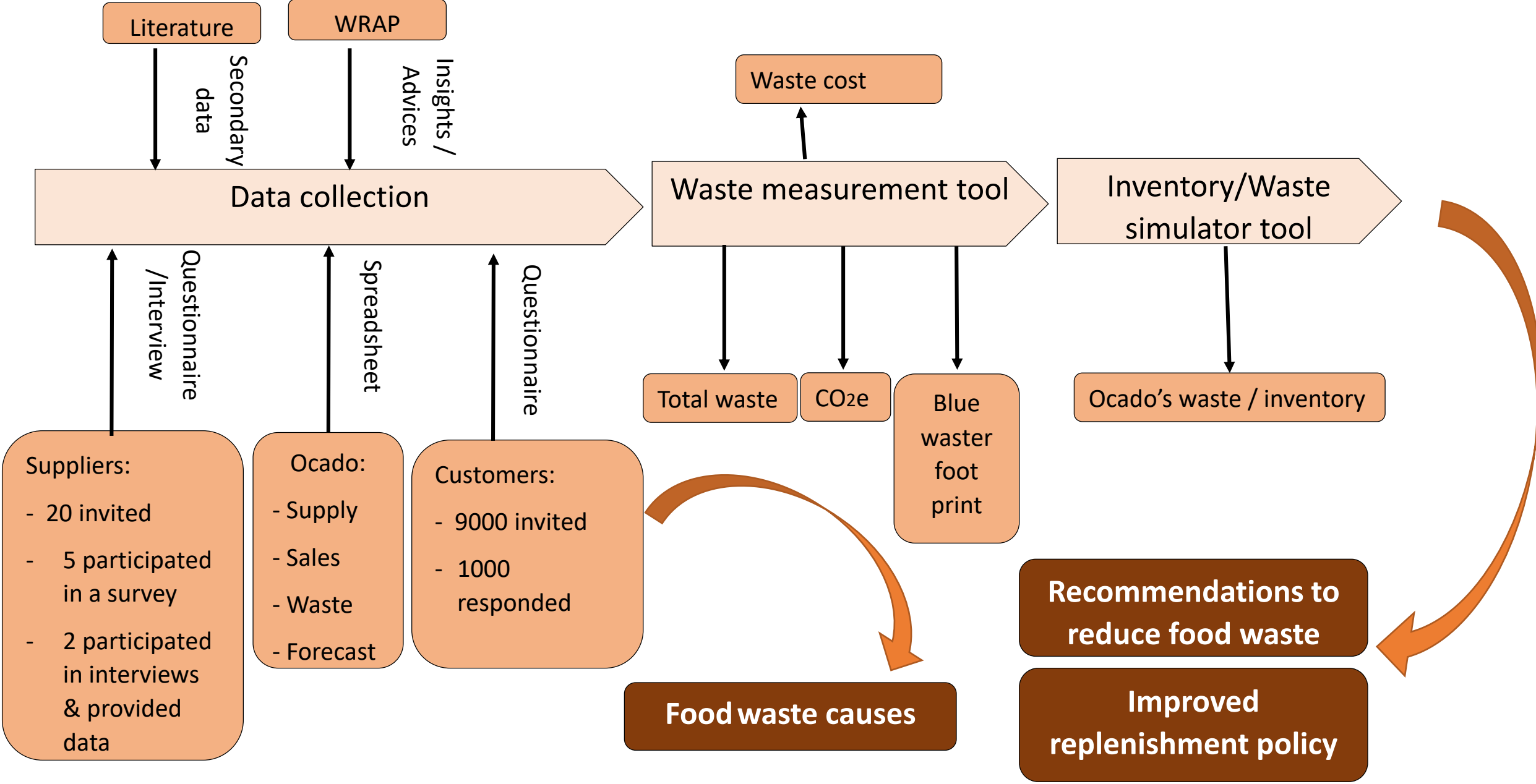
- Project description
- Project approach
- Research findings – salad waste across the Ocado supply chain and potential mitigation measures
- Managerial implications
- Project outputs and report/case study brief



# Project description

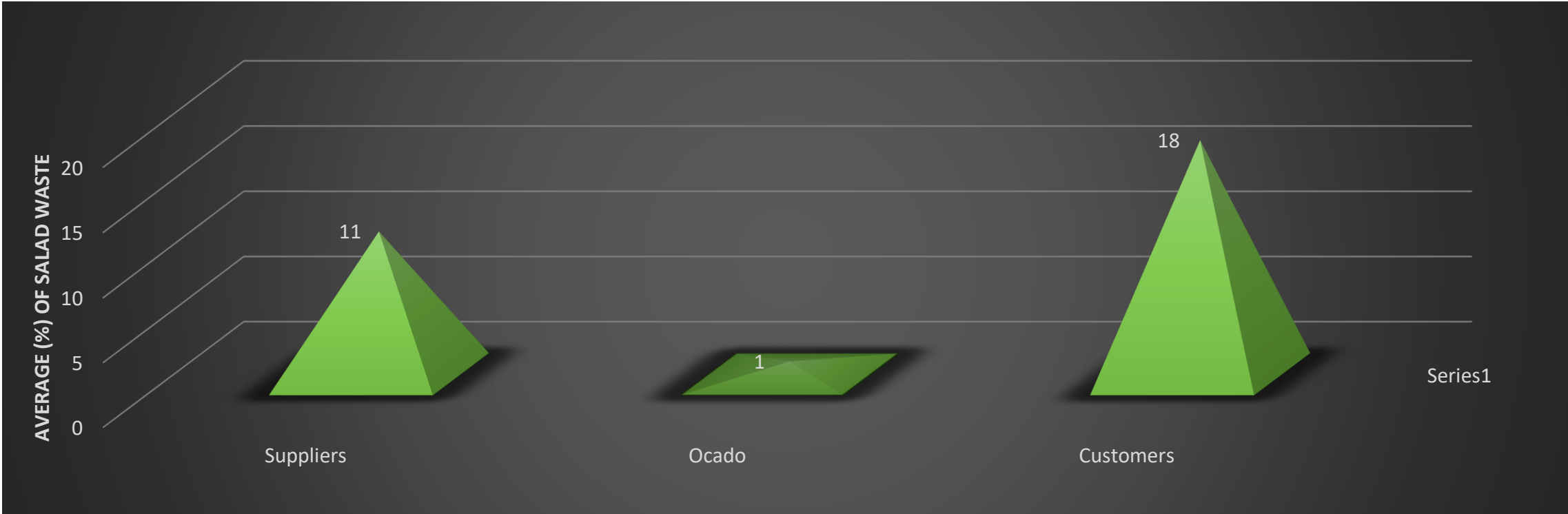
- The project is championed by two Ocado departments, supply chain and CSR;
- The total funding awarded to CARBS is £50K, though the project aspires to be the start of a long-term joint research collaboration among Ocado, CARBS and WRAP;
- The project aims to design a food waste measurement tool for Ocado's perishable food categories, and test that tool in specific salads categories;
- The project also aims to generate a best practice guide, and case study to be published in the Ocado 2018/2019 CSR report; and;
- The project outputs generated are being/will be disseminated via the ECR Shrink Group, IGD and WRAP.

# Project approach



Research findings – salad waste measurement & mitigation

# Overall results - Shared waste against total production output across the Ocado salad supply chain



Average (%) total waste at suppliers, Ocado and customers.

## Stage 2 results - Share of waste (%) in Tonnes across the Ocado supply chain

**In conventional UK retail supply chains, the average % of products donated to charity/binning is about 1%**

Salad category	Supplier crop waste (%)	Ocado salad waste (%)	Customer salad waste (%)
<b>Mixed leaves</b>	23.4	0.065	12.4
<b>Lettuce</b>	16.1	0.096	12.0
<b>Tomatoes</b>	11.6	0.026	13.1

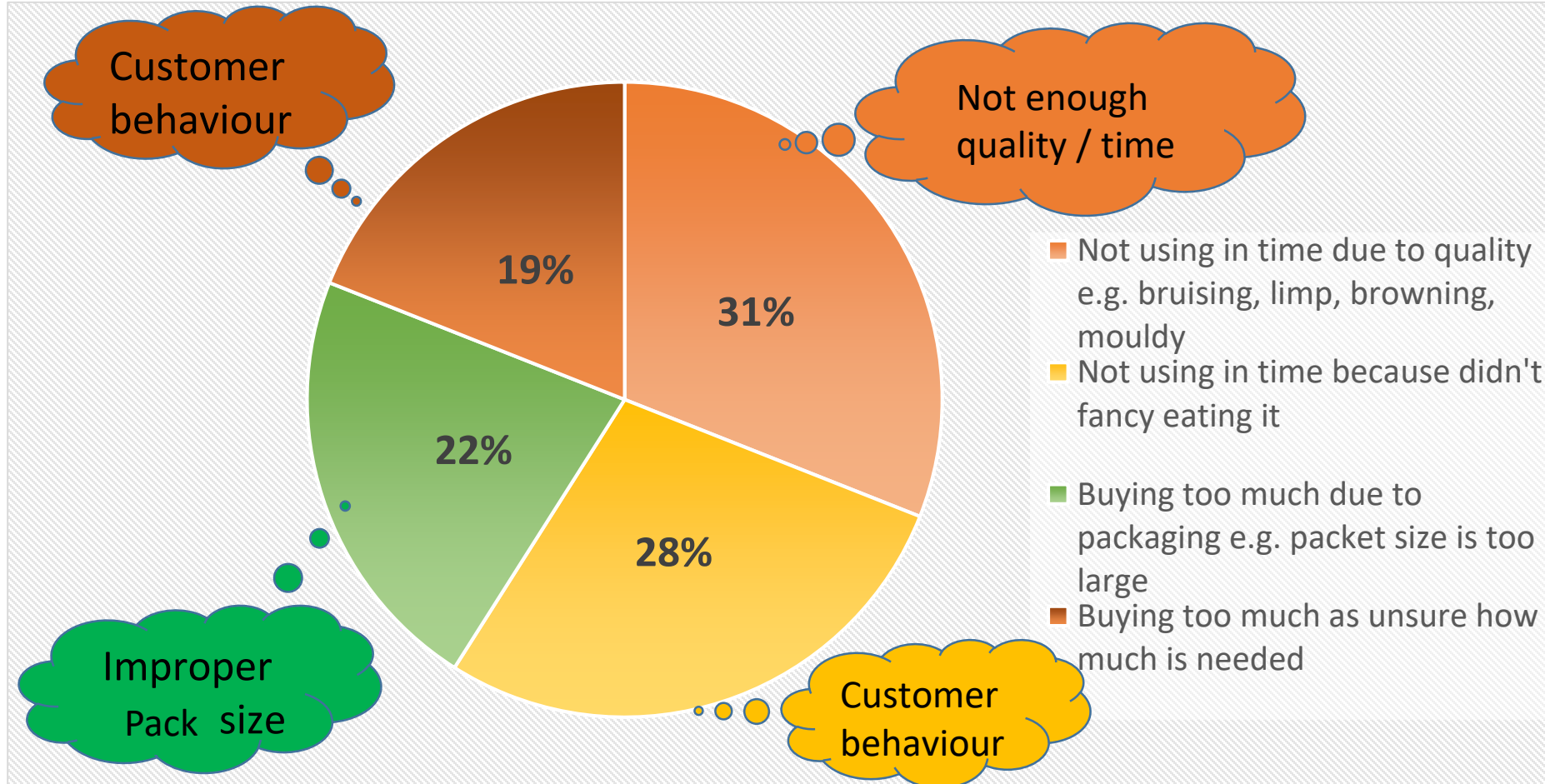
**Could managers from retailers in the audience share with us their company share of waste across these salad categories?**

# Top causes of food waste: supplier's perspective

<b>Cause</b>	<b>Number of suppliers</b>
<b>Poor demand forecast</b>	<b>5</b>
<b>Poor quality, reject by retailers.</b>	<b>3</b>
<b>Inefficient information sharing between farmers and retailers (lack of visibility)</b>	<b>3</b>
<b>Issues like mould and diseases</b>	<b>2</b>



# Top causes of food waste: customer's perspective



# Current food waste mitigation actions by suppliers and customers



- Compost
- Anaerobic digestion (the process by which organic matter such as animal or food waste is broken down to produce biogas and bio-fertilizer)
- Charities
- Energy generation (e.g., renewable)

- Dispose
- Pet food
- Collection
- Compost

# Causes, potential projects & Ocado's stand

Top causes	Future actions
<b>Measurement methodology not developed for online grocery SCs</b> Based the causes and sources of waste we found, do you have any advice on specific	Refine the food waste measurement tool developed for other UK online grocery retail supply chains. Ocado will be leading a joint effort Inputs from WRAP & CARBS via IGD.
<b>Fluctuated Ocado orders to suppliers</b>	Design and run a pilot project to assess different perishable product supplier order forecasting and inventory control models.
<b>Crops affected by weather are not considered in forecasting policy</b>	Extend waste-reduction decision-making of promotions Ocado has to include suppliers the forecast of weather-sensitive crops
<b>Product specifications can become more flexible</b>	Design a customer questionnaire to identify and eliminate unnecessary product characteristics
<b>Lack of information visibility</b>	Provide more suppliers with earlier visibility of Ocado orders by extending the existing Vendor Managed Inventory System
<b>Deviation between supplier order and quantity received at CFCs</b>	Design and run a transport routing modelling-based research project to identify supplier network planning models that could reduce the deviation between supplier order and quantity received at CFCs.

follow-up projects we could pursue?



High priority/short-term



High priority/medium-term



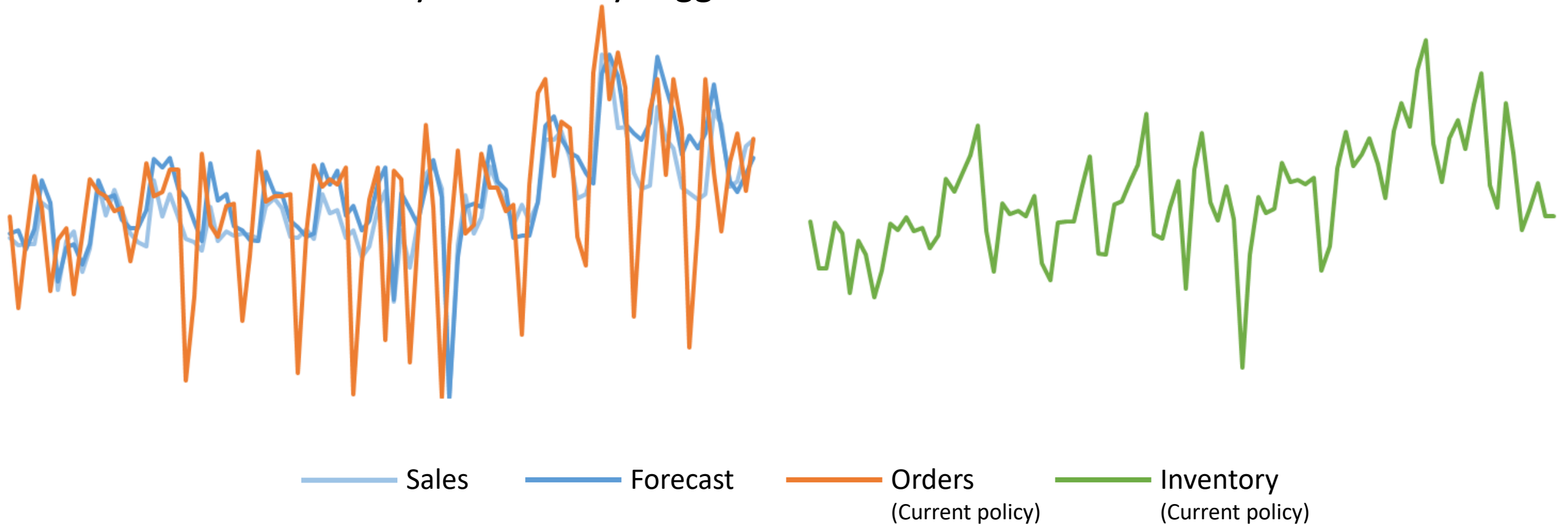
Low to medium priority/medium-term

# Simulation model results: Sales against forecast



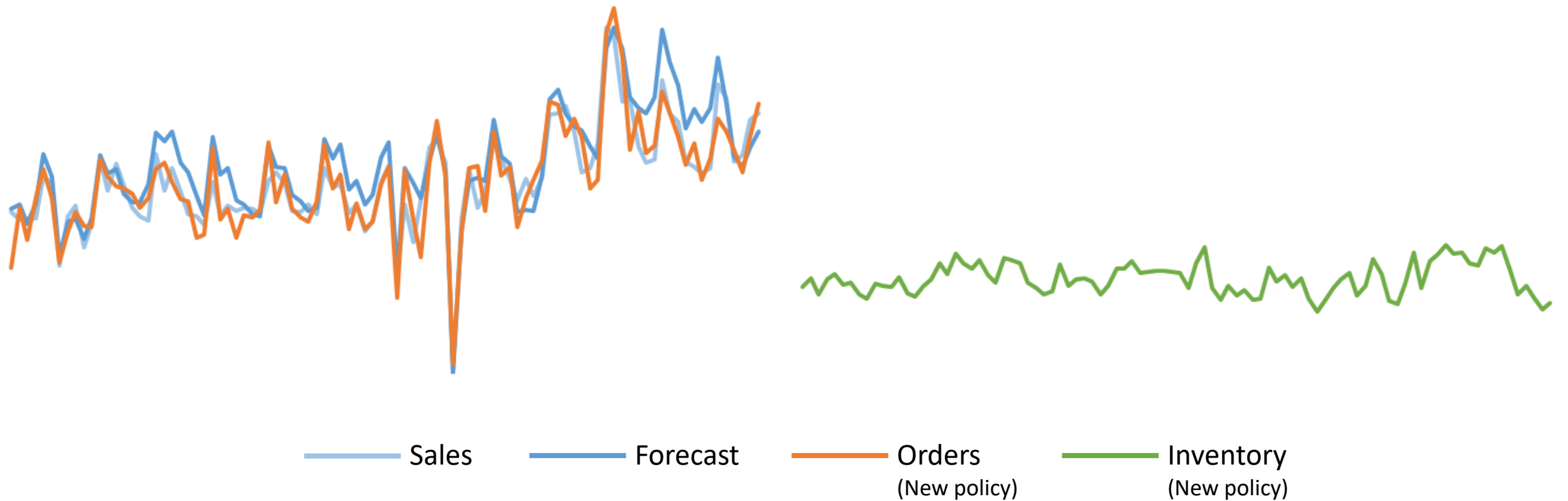
# Simulation model results: Sales versus supplier orders & inventory

Is the significant level of demand amplification we found avoidable?  
Do you have any suggestions on how to reduce it?



# Simulation model results: Proposed model

Order-up-to policy introduce to Ocado with the aim of making the Ocado order changed with shorter forecast of customer orders



# Managerial implications

- Who is wasting?
- Where is food waste going to?
- Where is food waste coming from?
- How much food is being wasted?
- What is the economic and environmental implications of wasted food?
- Why food is wasted?
- What is the relationship between inventory and food waste?

# Additional questions for you

- Any lessons learned from your own ecommerce operations on these three categories that you could share with us?
- Has anything been done on these salads categories to get the right size packs to the shopper to reduce waste?
- What about the famous spray to make your salads last ten days longer discussed during the June ECR meeting?



# Project outputs

## Food waste measurement tool

## Inventory/waste simulator

**INPUT**

**STEP 1:** Get OCADO Data

**STEP 2:** Get SUPPLIER Data

**STEP 3:** Visualise

**STEP 4:** Clear ALL Data

**OUTPUT (I)**

For a given Ocado data:

TOTAL OCADO SALES (eaches)

TOTAL SUPPLIER WASTE (eaches) Total Supplier Shipment to Ocado

TOTAL OCADO WASTE (BIN) (eaches) TOTAL OCADO COST (£)

TOTAL CUSTOMER WASTE (eaches)

TOTAL WASTE (eaches)

Supplier	OCADO Waste (eaches)			CUSTOMER Waste (eaches)	TOTAL
	Purge	Shop	Food Bank/ Bin		
Monthly waste values					
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

**OUTPUT (II)**

**Waste Measurement Tool**

OCADO SALAD WASTE MEASUREMENT TOOL

Start

**The Three Pillars of Sustainability**

Environmental	Economic	Social
Supplier waste (%)	Ocado's loss (in £)	Donation rate (%)
Ocado waste (%)	Ocado's Opportunity Cost (in £)	
Customer waste (%)		
CO2e emissions (Transportation, in kg)		
CO2e emissions (Organic, in kg)		
Bluewater footprint		

Sales	Forecast	Forecast Error	Order	Receipt	Inventory-4	Inventory-3	Inventory-2	Purge		
					700	0	0			
669	683	-14	756	756	756	31	0	0	Max. Life	4
635	700	-65	372	372	372	152	0	0	Min. Life	2
642	618	24	648	648	530	0	0	0	Lead-time	1
641	702	-61	924	924	813	0	0	0		
816	908	-92	792	792	789	0	0	0	T. Purge	211
789	816	-27	444	444	444	0	0	0	% Purge	0.278842
447	485	-38	660	660	657	0	0	0	Availability	1
652	626	26	708	708	708	5	0	0		
694	640	54	430	430	430	19	0	0		
523	556	-33	680	680	606	0	0	0		
621	641	-20	910	910	895	0	0	0		
891	906	-15	860	860	860	4	0	0		
759	830	-71	840	840	840	105	0	0		
867	845	22	780	780	780	78	0	0		
781	744	37	790	790	790	77	0	0		
685	706	-21	570	570	570	182	0	0		
650	707	-57	720	720	720	102	0	0		
632	782	-150	980	980	980	190	0	0		
908	997	-89	840	840	840	262	0	0		
757	963	-206	860	860	860	345	0	0		
850	1001	-151	950	950	950	355	0	0		
754	874	-120	950	950	950	551	0	0		
661	833	-172	70	70	70	840	0	0		
651	733	-82	420	420	420	70	189	0		
613	656	-43	1020	1020	1020	66	0	0		
795	979	-184	720	720	720	291	0	0		
654	823	-169	670	670	670	357	0	0		
694	849	-155	800	800	800	333	0	0		
674	718	-44	810	810	810	459	0	0		
687	700	-13	320	320	320	582	0	0		

# Project report and case study brief



Cardiff Business School  
Ysgol Busnes Caerdydd



*Food Waste in the Online Grocery Supply Chain: The Case of Ocado's Salads*

Prepared by Cardiff University and Ocado in collaboration with WRAP UK

*Towards Ocado salad supply chain zero waste strategy*

*THANK YOU*