

**IDENTIFICATION OF EVERYDAY
FOOD-RELATED BEHAVIOUR PATTERNS
WITH HIGH POTENTIAL FOR
DIRECT AND INDIRECT ENERGY SAVINGS**

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BEHAVE CONFERENCE

22.04.2021



MOTIVATION

Nowadays, electricity consumption associated with food-related everyday behaviours is significantly increasing due to the situation of covid-19, which continuously forces people to cook mostly at home.

If the estimate of energy usage associated with cooking was previously determined by 2-7% of the total electricity consumption from the household's total energy demand, then today this figure has grown up to 15-20%.

STUDY SCOPE

*The experimental study was designed to examine in detail the behaviours of tenants at KTH Live-in-Lab to **identify individual food-related behaviour patterns** with the low, medium, and high level of energy saving potential.*

Despite the small study group, we tried to focus specifically on identifying behavioural patterns that are associated with individual choices of a particular persona profile and its impact on energy consumption. Such patterns can be identified and tracked at the individual level, and only then proceed to a larger-scale experiment.

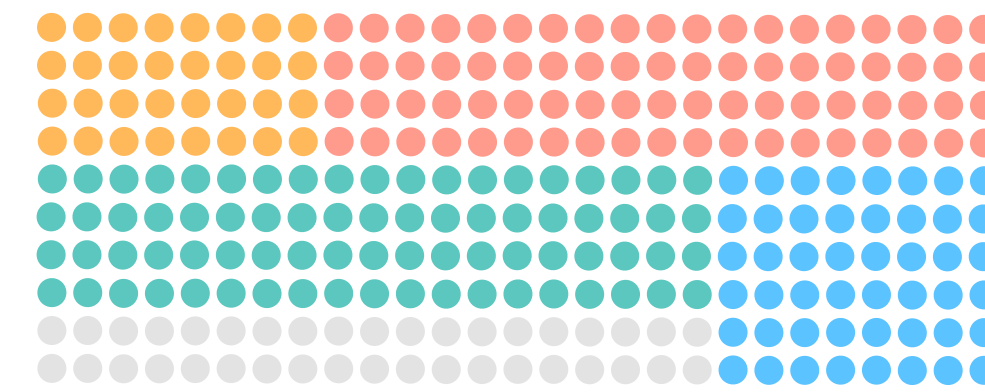
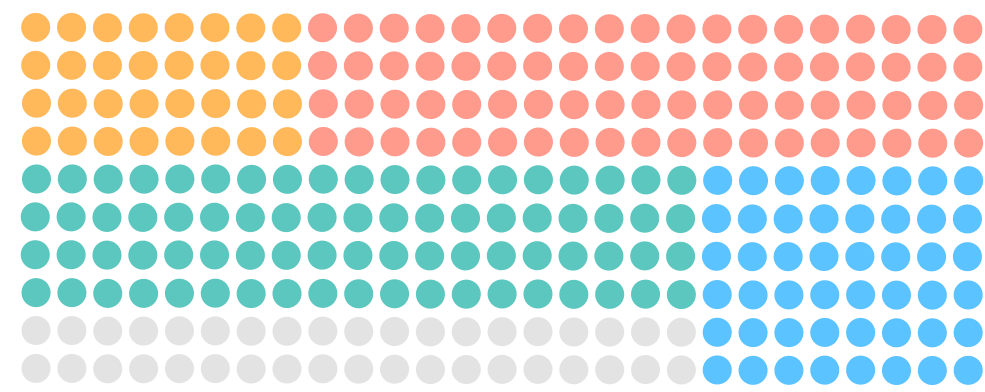
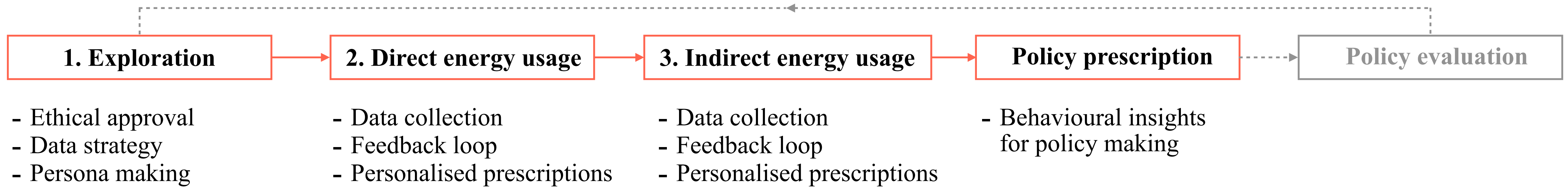
KTH Live-in-Lab testbed



KTH Live-in Lab is a platform of multiple testbeds for accelerating innovation rates in the construction and real-estate sectors.

4 apartments are living laboratory, 300 apartments are passive laboratory for the scale up

DESIGN RESEARCH METHODOLOGY



300 students persona making survey

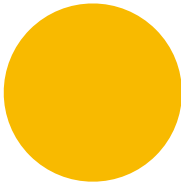
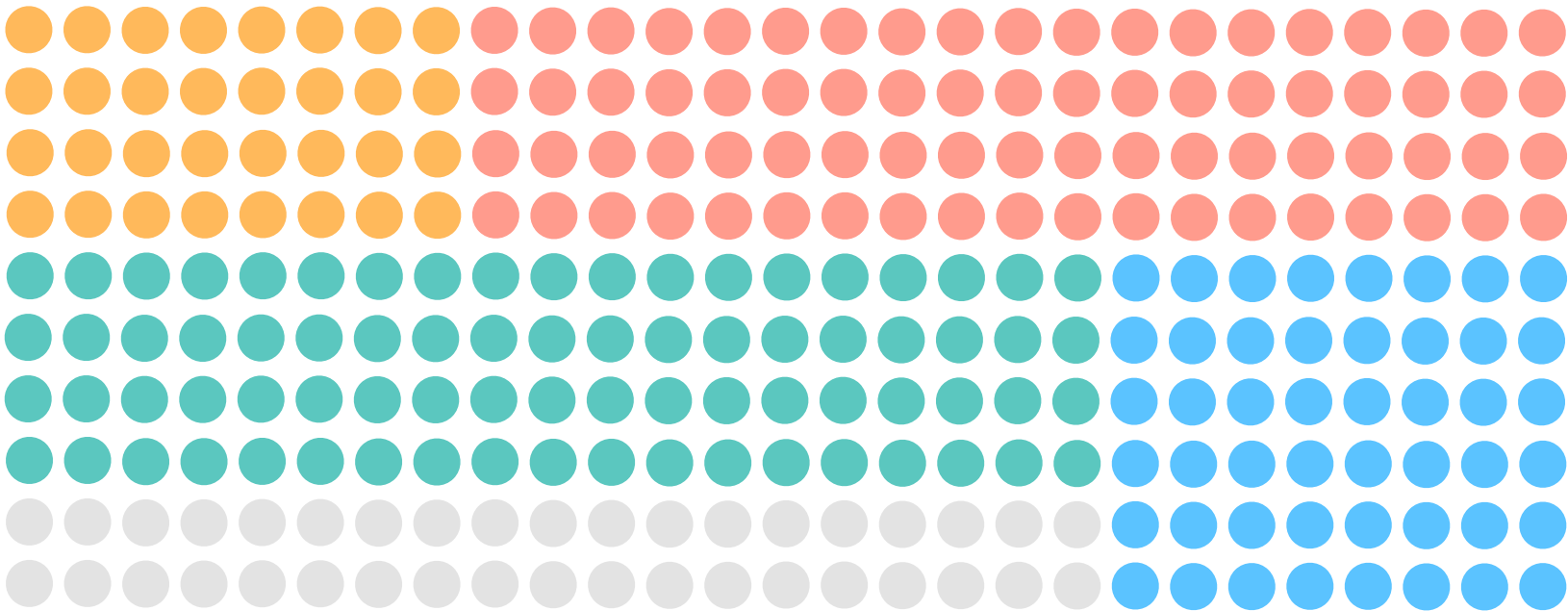
4 experimental apartments for active R&D

300 students feedback loop & scale up ... or continue to iterate

KTH Live-in-Lab: Personas

Based on the survey (125 / 300)

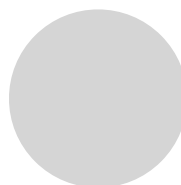
5 personas were created, 4 were represented at living laboratory



Busy

35%

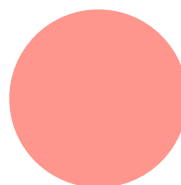
'I want to be more environmentally friendly, but I have no time'



Doesn't matter

25%

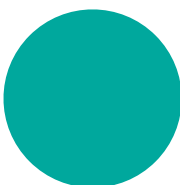
'I just don't care'



Gourmet

17%

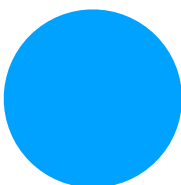
'I LOVE food and it is a huge source of pleasure for me'



Veggie

14%

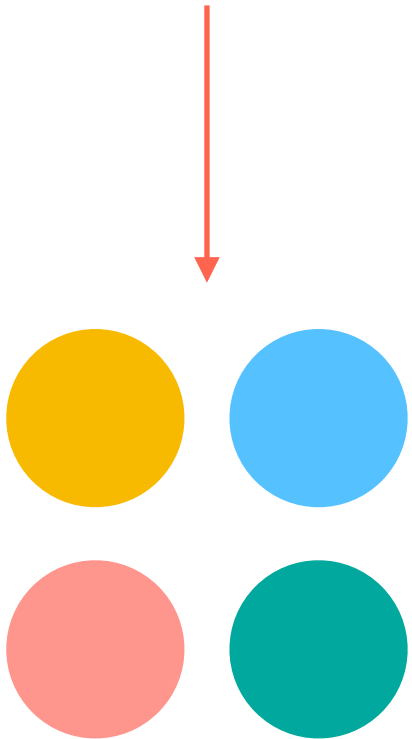
'I do care about planet and ethics of food'



Athlet

9%

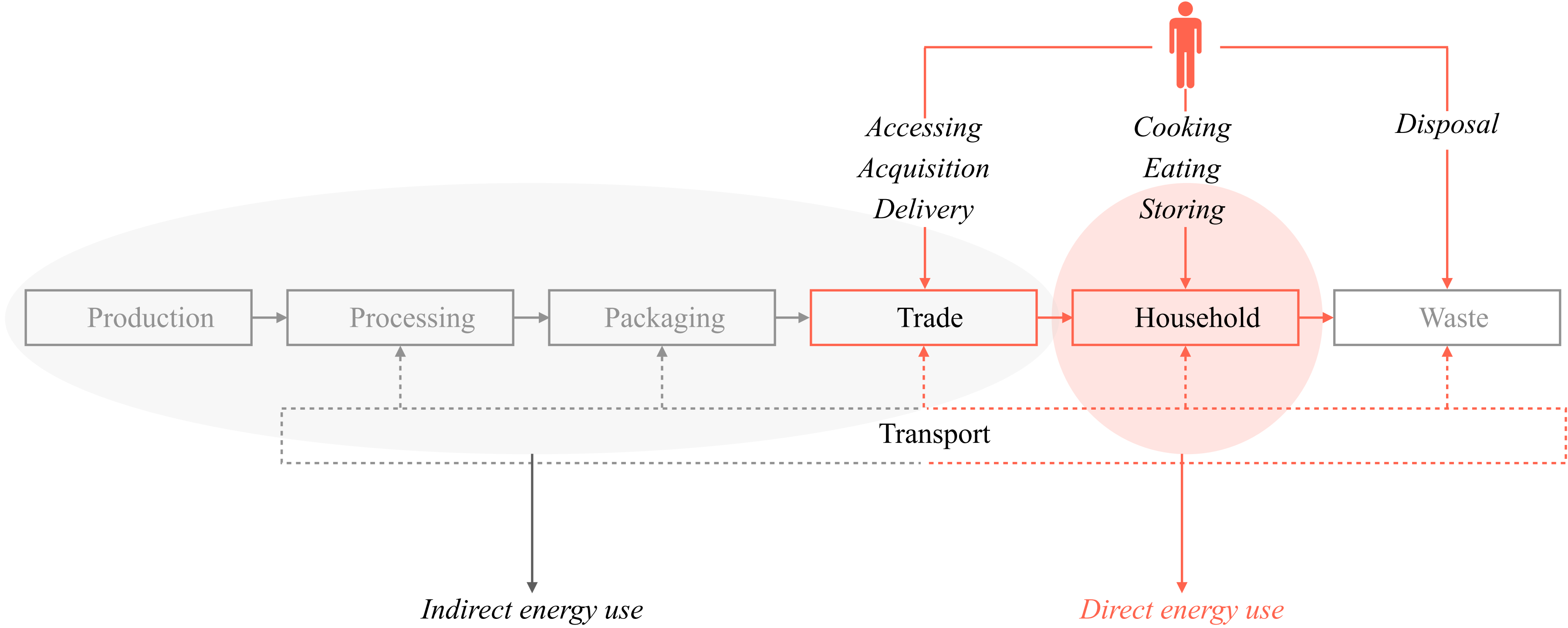
'Food is a fuel for my body'



RESEARCH BOUNDARIES



FOOD SUPPLY CHAIN: INDIVIDUAL LEVEL OF INTERACTION



DATA COLLECTION

Food supply chain data



Food bills

Data:

Product name
Product code
Price

Meta data:

Store location
Item country of origin
Item type of package
Item temperature of storing
Timestamp

Electricity meters

Data:

Electricity usage :
oven, microwave,
stove, plugs over
the kitchen

Meta data:

Type of home
appliance
Preparation type
Timestamp

Food pictures

Data:

Image of each meal

Meta data:

Size of the portion
Preparation type
Timestamp

Bin sensors

Data:

Weight of:
Mixed waste,
plastic, carton /
paper, glass, metal

Meta data:

Timestamp

Personal data



Daily survey

Data:

Meal content description,
Preparation type
Eating alone / Together
Quantity of leftovers

Meta data:

Timestamp

Wearable device

Data:

Activity rate
Sleeping rate

Meta data:

Timestamp

FOOD RELATED ACTIVITIES ENERGY ANALYSIS: 1 MONTH PERIOD

'GOURMET'

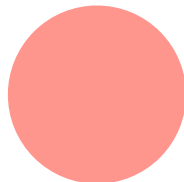
'BUSY'

'ATHLET'

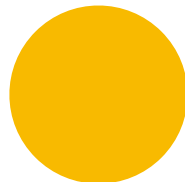
'VEGGIE'

Food related activity	'GOURMET'			'BUSY'			'ATHLET'			'VEGGIE'		
	Energy use (direct)	Energy use (indirect)	Potential for energy saving	Energy use (direct)	Energy use (indirect)	Potential for energy saving	Energy use (direct)	Energy use (indirect)	Potential for energy saving	Energy use (direct)	Energy use (indirect)	Potential for energy saving
Acquisition	-	28 kWh	High	-	42 kWh	High	-	22 kWh	High	-	12 kWh	Low
Delivery	-	1,2 kWh	Low	-	0,5 kWh	Low	-	-	Low	-	-	Low
Cooking	30 kWh	-	High	15 kWh	-	Medium	25kWh	-	High	20 kWh	-	Medium
Eating	2,4 kWh	-	Low	2,4 kWh	-	Low	2,4 kWh	-	Low	1,8 kWh	-	Low
Storing	6,4 kWh	-	-	6,4 kWh	-	-	6,4 kWh	-	-	6,4 kWh	-	Low
Cleaning	1,8 kWh	-	Low	1,8 kWh	-	Low	1,8 kWh	-	Low	0,8 kWh	-	Low
Packaging	10 kg		High	7 kg		High	5 kg		High	3 kg		Low

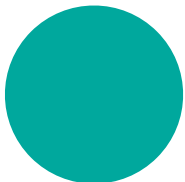
BEHAVIOURAL STRATEGIES FOR EACH PERSONA



Gourmet



Busy



Veggie



Athlet

Acquisition

Buy less processed food

Buy less processed food

-

Buy less processed food

Cooking

Low energy cooking recipes

Preparing more leftovers

Preparing more leftovers

Preparing more leftovers

Packaging

Buy less packaged food

Buy less packaged food

-

Prepare own snacks

Taste is important

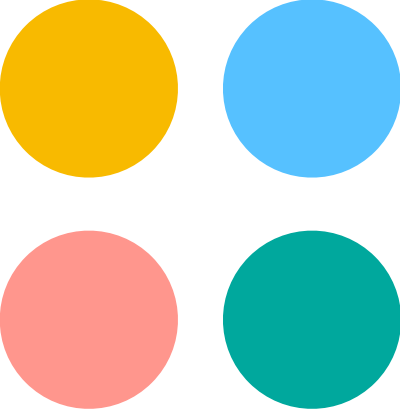
Time is important

Ethics is important

Sport diet is important

POTENTIAL FOR ENERGY SAVING: DIRECT & INDIRECT

4 Living laboratory apartments



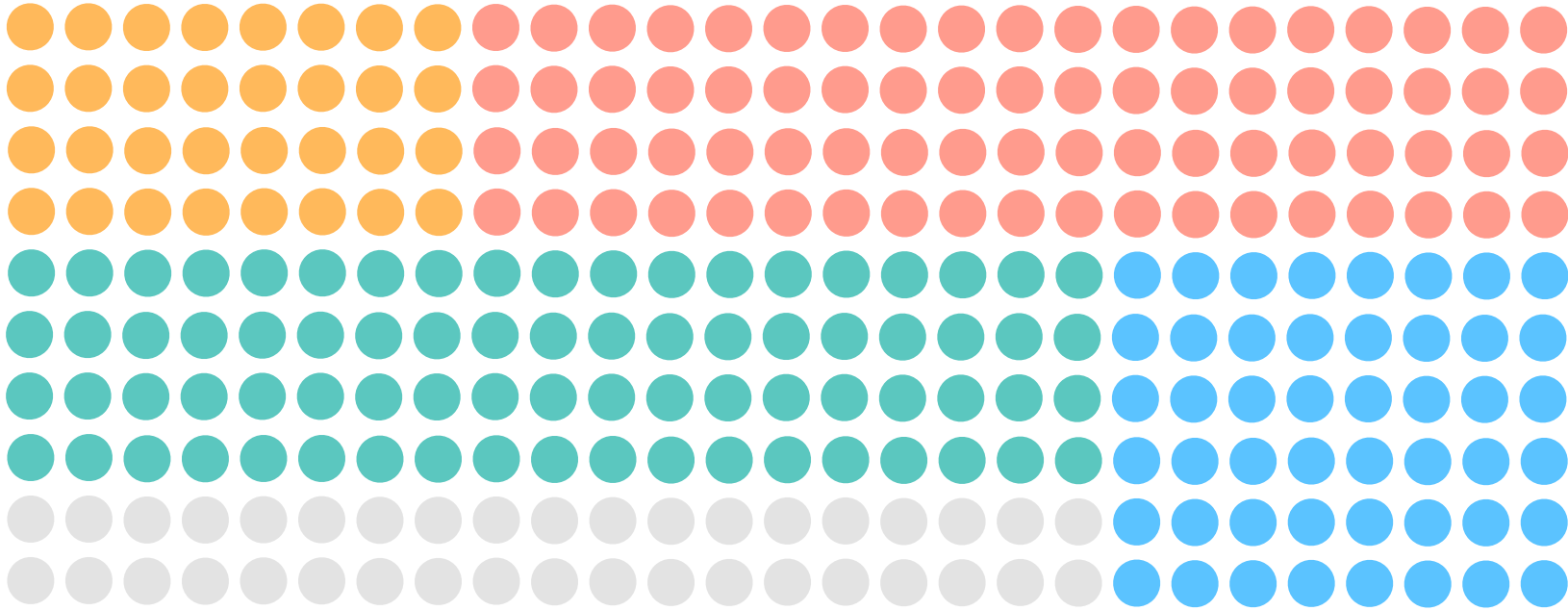
Direct

Indirect

18-20% per month

7-12% per month

300 students' apartments



Direct

Indirect

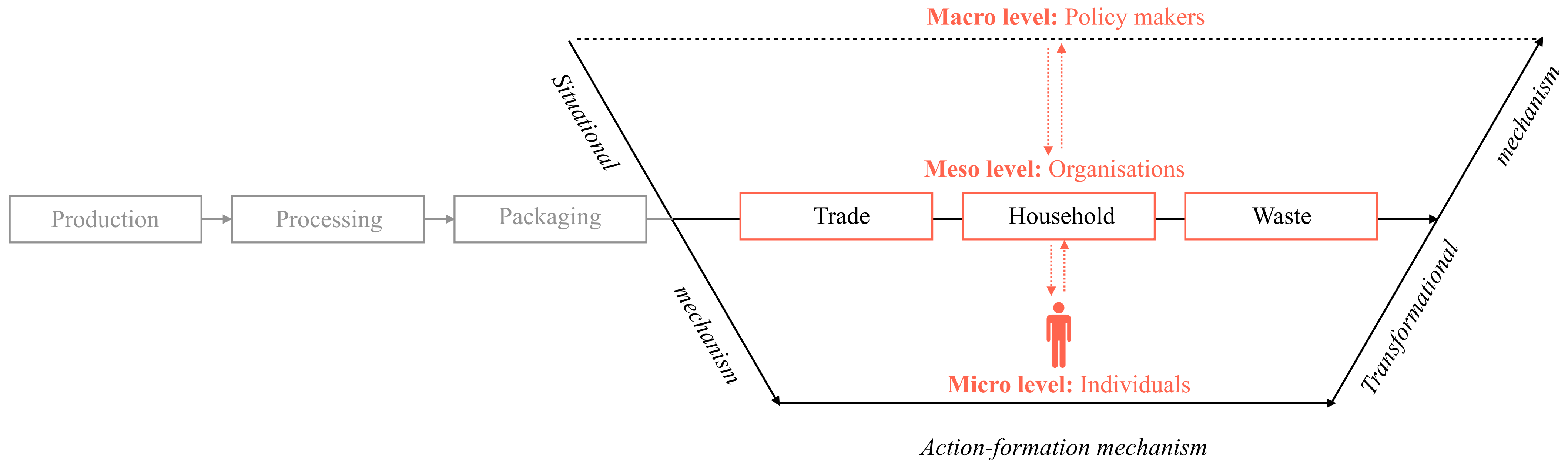
10-15% per month

5-10% per month

POLICY PRESCRIPTIONS

1. Trade: most of the decisions about food related behaviours are happening in the grocery store and we need to rethink the acquisition process (zoning, labelling, etc)

2. Household: motivate kitchen appliances producers design not only default 'ECO' functions, but build upon the products assistive services to interact with the end-users



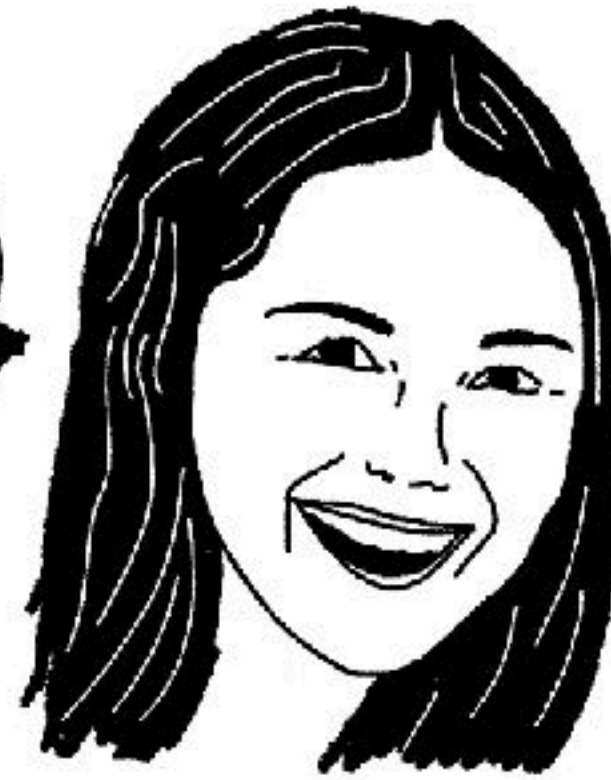
*“We must design for the way people behave,
not for how we would wish them to behave.”*

— Donald A. Norman | Living With Complexity

KTH LIL CHEFS



THE BARRISTA



JAMIE OLIVER
DAUGHTER



LEAK TART
EXPERT



PIZZA BUILDER



THANK YOU +

APPENDIX

1. Baked meal	Wh	2. Long cooking recipes	Wh
Homemade pizza	1284 1141	White bean dish (tomato, bacon)	881
Leak pie	1080 1090	Vegan tikka massala	846
Baked chicken with veggies	1262	Stew chicken	822
Self made bagels	1155	Soup (kale, onion, carrot, leak, potatoes)	681
Cooked veggies and rösti	691		
3. Mixed boiled and fried	Wh	4. Boiled/ short fried	Wh
Pasta with homemade sauce	561 557	Boiled potato or mashed potato	177 227
Rice with chicken in sauce	405	Scrambled eggs (+bacon)	187 132 114
Curry with vegetables	457	Boiled eggs	246
		Instant noodle	105