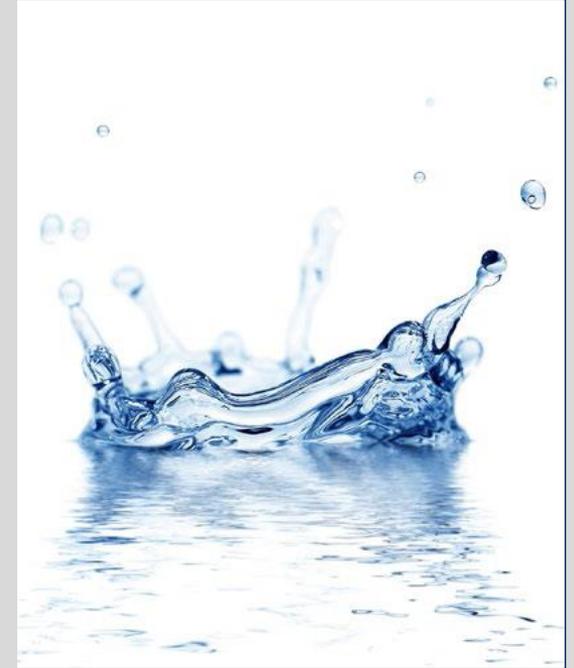




**EPRU**  
ENVIRONMENTAL-ECONOMICS POLICY RESEARCH UNIT



## Behavioural interventions for saving water – Experimental evidence from the City of Cape Town



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Future Water Symposium  
University of Cape Town  
28<sup>th</sup> July 2017

# OUTLINE



## Brief Overview of Behavioural Nudges

- Background on Behavioural Insights:
- Partnership with City of CTty of Cape Town)



## Design

- Randomized Control Trials
- Research Findings



## Research Findings

- Immediate Impacts
- Long-term impact & comparison to tariff hikes



## Strategic Directions

- Water savings Maps
- Incentivized Uptake of Apps
- Rolling out DropDrop App to E-billers

# PROJECT BACKGROUND: From traditional Demand Side Management to Behavioural Economics

Traditional strategies to promote water/electricity conservation:

- 1 Price-based approaches (tariff, tax)
- 2 Structural approaches (water restrictions, load shedding)
- 3 Information/education campaigns



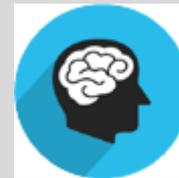
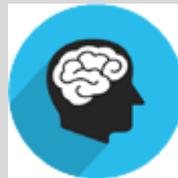
## Non-price based behavioural interventions

- Inexpensive
- Scalable
- Don't feel punitive (income spectrum)



# PROJECT BACKGROUND: What is Behavioural Economics?

- Some of the **simplifying assumptions of economic theory are not always correct**:
  - People do not always act in their long-term self-interest
  - People do not always weigh up costs and benefits before making a decision
  - People do not have unlimited attention or endless information



- Behavioural Economics combines **insights from cognitive and social psychology and economic theory** to take true human decision-making into account.

# Behavioural Insights:

## Social Norms

Saliency



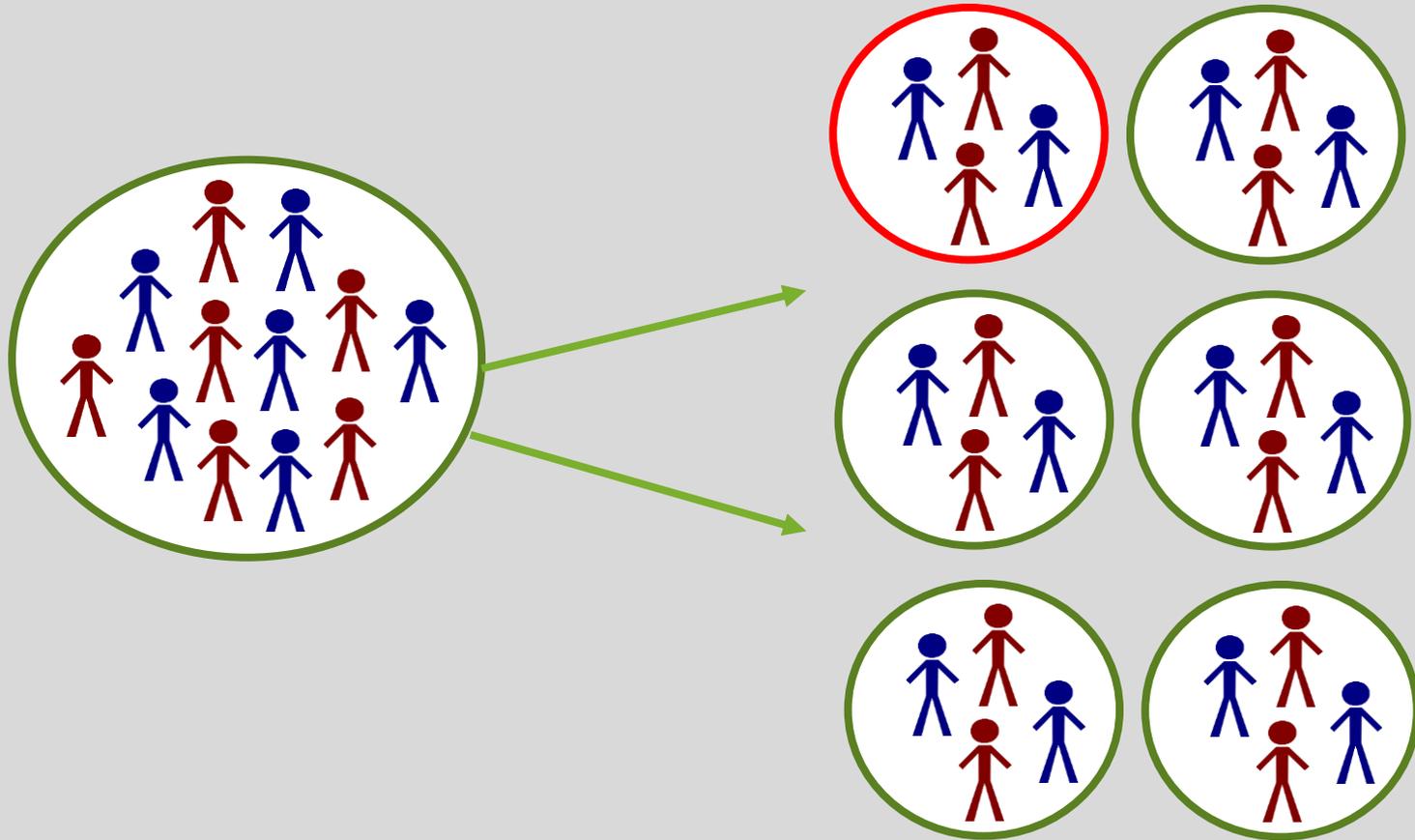
Social Recognition

# City Of Cape Town PARTNERSHIP

- EPRU Project: Funding obtained via NRF-NORWAY Bilateral agreement; WRC, Environment for Development Initiative
- 3.5 year process of forming relationships; getting agreements in place; accessing data and rolling out the study
- Confidentiality Agreement with Utilities Directorate related to data access
- Partnership Agreement with Water Demand Management Department

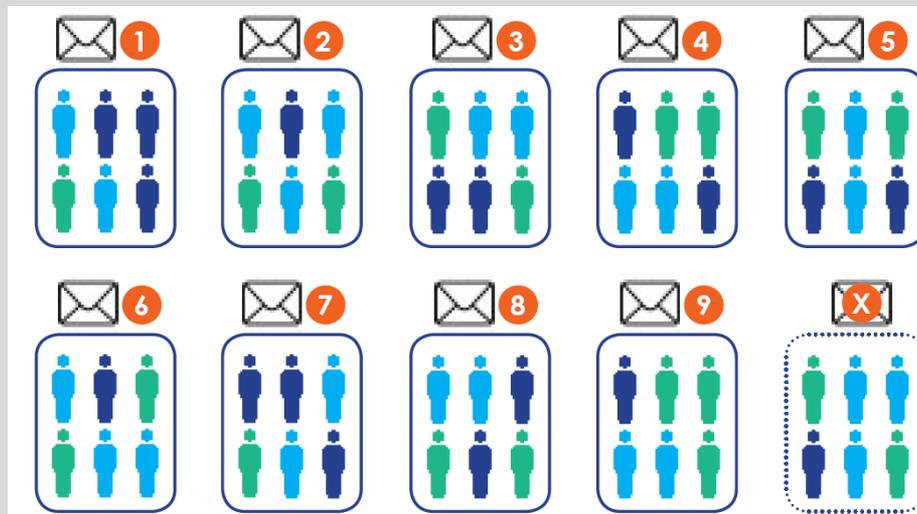


# RANDOMISED CONTROL TRIALS



# STUDY DESIGN: Overview

- City-wide Randomised Control Trial with a sample of over **400 000 households (BIG DATA)**
- Nine different behavioural messages were sent out to households over a six-month period



- Households in the control group did not receive a message
- Messages were randomly allocated to households

# BEHAVIOURAL MESSAGES

B#1 Tips

B#2 Tariff graph

B#3 Financial gain

B#4 Financial loss

B#5 Social comparison

B#6 Intrinsic motivation

B#7 Compulsory social recognition

B#8 Opt-out social recognition

B#9 Public good

**MESSAGES**



# WATER SAVING TIPS

## QUICK FIXES THINGS YOU CAN DO RIGHT NOW



### Take shorter showers

A standard showerhead can use as much as 16 litres per minute. If you shorten your shower by only three minutes, you can save up to 48 litres per shower. For a family of four, this amounts to 5 760 litres (5.76 kilolitres) per month!



### Don't leave taps running

A running tap can use 20 litres of water per minute. Turn off the tap when brushing your teeth, shaving and washing dishes. If you spend 2 minutes each day brushing your teeth and you leave the tap running, you use 1 200 litres (1.2 kilolitres) per month. This amounts to 4 800 litres (4.8 kilolitres) for a family of four. Reduce your consumption to only a fraction of this by switching off the tap!



### Have a smaller bath

If you only fill your bath halfway, you would save between 40 to 75 litres each bath. A saving of 40 litres per bath for a family of four amounts to 4 800 litres (4.8 kilolitres) of water saved every month!



### Fix leaks immediately

## SMART PURCHASES SAVE A LOT BY SPENDING A LITTLE



### Use a water-saving showerhead

A water-efficient showerhead can use as little as 6 litres of water per minute. Switching from a normal to a water-efficient showerhead can save as much as 10 litres of water per minute. This means a family of four can save 1 200 litres (1.2 kilolitres) per minute each month without any other behavioural change.



### Fit taps with water-saving devices

Tap aerators, which screw onto your taps, reduce the flow of water by mixing air into the water flow. While normal tap-flow is between 20-30 litres per minute, these water-saving devices can reduce the flowrate to as little as 6 litres per minute.



### Reduce the water used per flush

Older toilets can use as much as 12 litres of water per flush. Converting your existing toilet to a multi-flush (interruptible flush) system can halve your water use per flush. If a family of four flushes the toilet 10 times per day, this is a saving of 1 800 litres (1.8 kilolitres) per month.

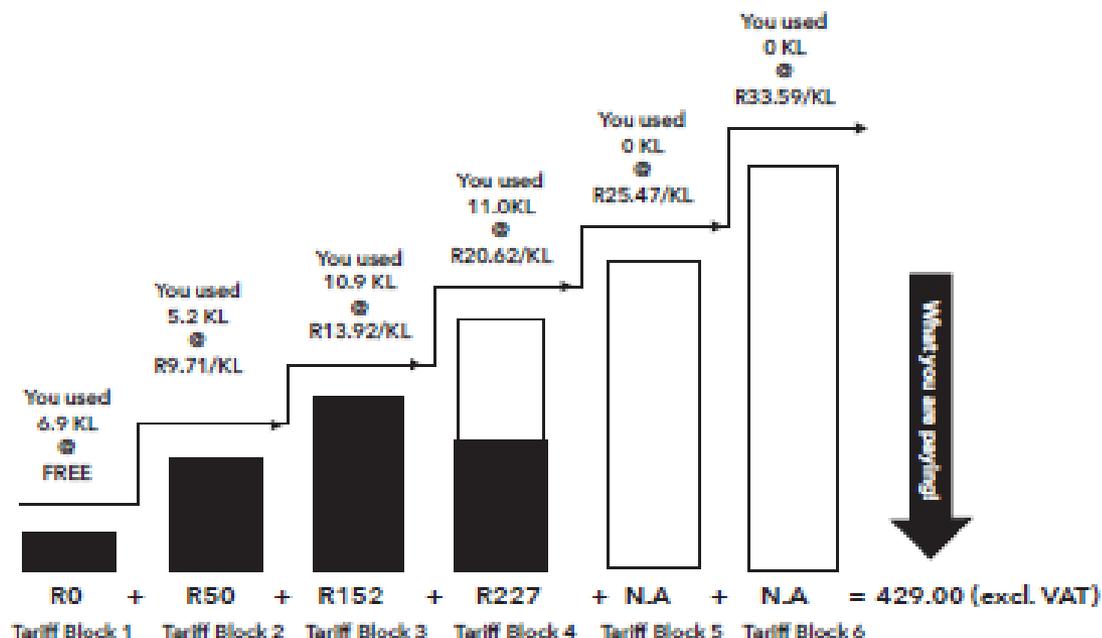


### Use a pool cover

# TARIFF GRAPH

## CHECK THIS BREAKDOWN OF YOUR WATER BILL!

YOU USED 34 KILOLITRES OF WATER THIS MONTH  
(Period 03/04/2015 to 07/05/2015 - 35 Days)



**Did you  
know?**

Water is priced in six tariff blocks.  
Check out which block your consumption falls into.  
As the blocks are stepped, consumption in the first block is free and  
consumption in the last block is the most expensive.

Not sure how to reduce your consumption?  
The tips on the back show you how!

# FINANCIAL GAIN

## YOU CAN GAIN R2 374 PER YEAR ON WATER BY NOT CONSUMING IN TARIFF BLOCK 4!

**If you had reduced your consumption by 11 kilolitres:**

- You would only be consuming in tariff blocks 1, 2, 3
- Your account would be reduced from R429 to R202

**By not consuming 11 kl in Tariff Block 4 (@R20.62), you would have SAVED R227 this month. And, what's more, if your consumption stayed at this reduced level for the rest of the year, you would SAVE R2 374!**

Not sure how to reduce your consumption?  
The tips on the back show you how!

# FINANCIAL LOSS

## YOU ARE LOSING R2 374 PER YEAR ON WATER BY CONSUMING IN TARIFF BLOCK 4!

**If you had reduced your consumption by 11 kilolitres:**

- You would only be consuming in tariff blocks 1, 2, 3
- Your account would be reduced from R429 to R202

**Consuming 11 kl in Tariff Block 4 (@R20.62) has COST you an extra R227 this month. And, what's more, keeping your consumption at the current level for the rest of the year would COST you an extra R2 374.**

Not sure how to reduce your consumption?  
The tips on the back show you how!

# SOCIAL NORMS

## CHECK OUT HOW YOUR CONSUMPTION LAST MONTH COMPARES TO YOUR NEIGHBOURHOOD!

Your daily average water consumption compared to the calculated average for your neighbourhood



**You consumed more (less) than your average neighbour last month!**

Not sure how to reduce your consumption (even more)?  
The tips on the back show you how!

# INTRINSIC MOTIVATION

## HELP TO SAVE WATER THIS SUMMER!

- The City is launching a water savings initiative over the summer months when water usage normally increases.
- Please try to reduce consumption by 10% between November and April.
- As you used 34 kl this month, this means you need to keep your monthly consumption around 31 kl.
- You will be notified of how your household did in May.
- **Get saving today!**

Not sure how to reduce your consumption?  
The tips on the back show you how!

# SOCIAL RECOGNITION

## BE PUBLICLY RECOGNISED FOR SAVING WATER!

- The City is launching a water savings initiative over the summer months when water usage normally increases.
- Please try to reduce consumption by 10% between November and April.
- As you used 34 kl this month, this means you need to keep your monthly consumption around 31 kl.
- The City will **publicly recognise** the achievement of all water-wise households by **publishing your name and suburb on the City's website**.
- You will be notified of how your household did in May.
- **Get saving today!**

Not sure how to reduce your consumption?  
The tips on the back show you how!

# PUBLIC GOOD

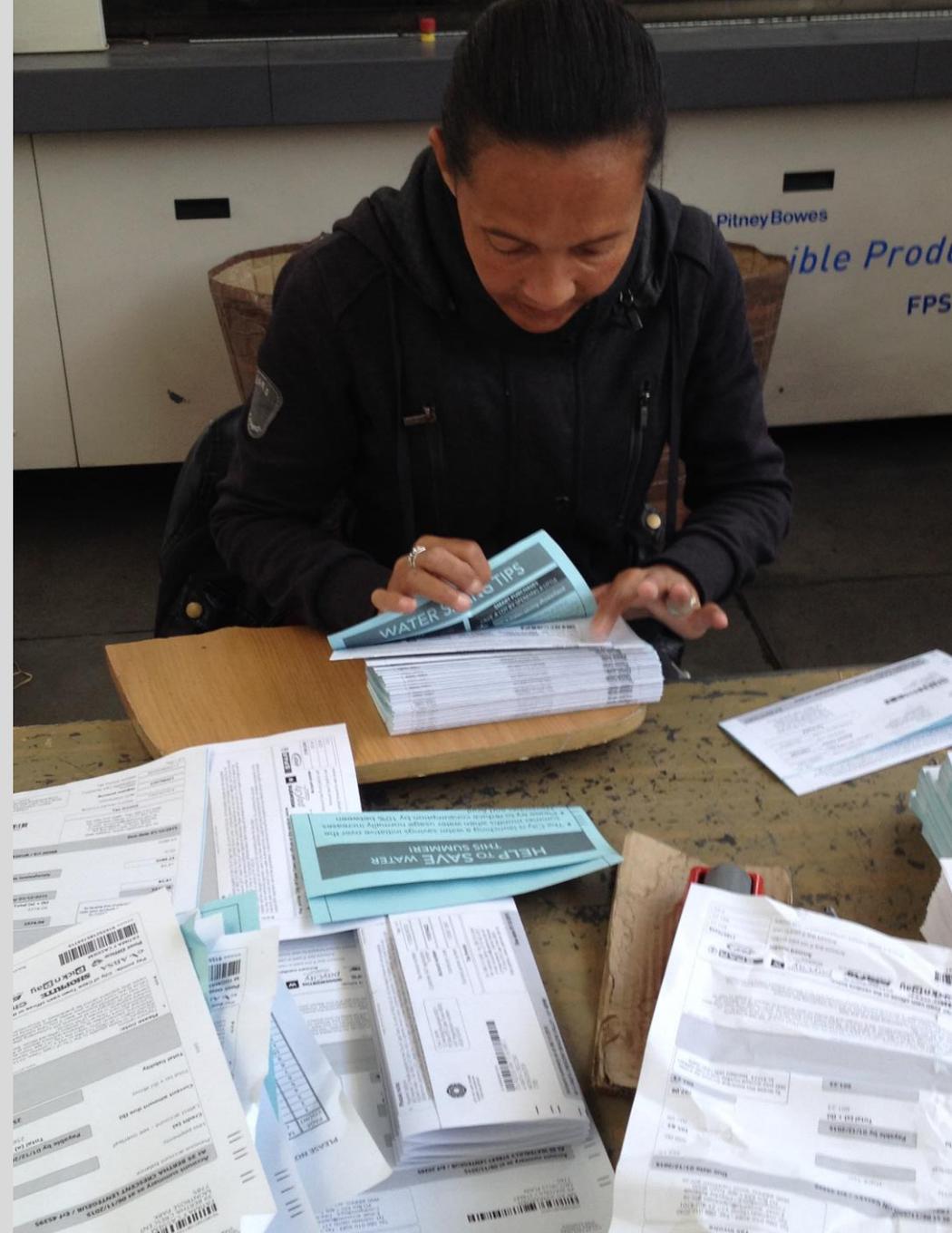
## A WATER-SCARCE CITY NEEDS EVERYONE TO SAVE WATER!

- Cape Town is a **water-scarce city**.
- As a water scarce region, we **all** need to balance available water resources with increasing demand for water.
- Try to conserve water as much as possible, particularly during the hot and dry summer weather when water usage increases.
- **If everyone saves water now we can prevent future water restrictions!**

Not sure how to reduce your consumption?  
The tips on the back show you how!

# BEHAVIOURAL MESSAGES

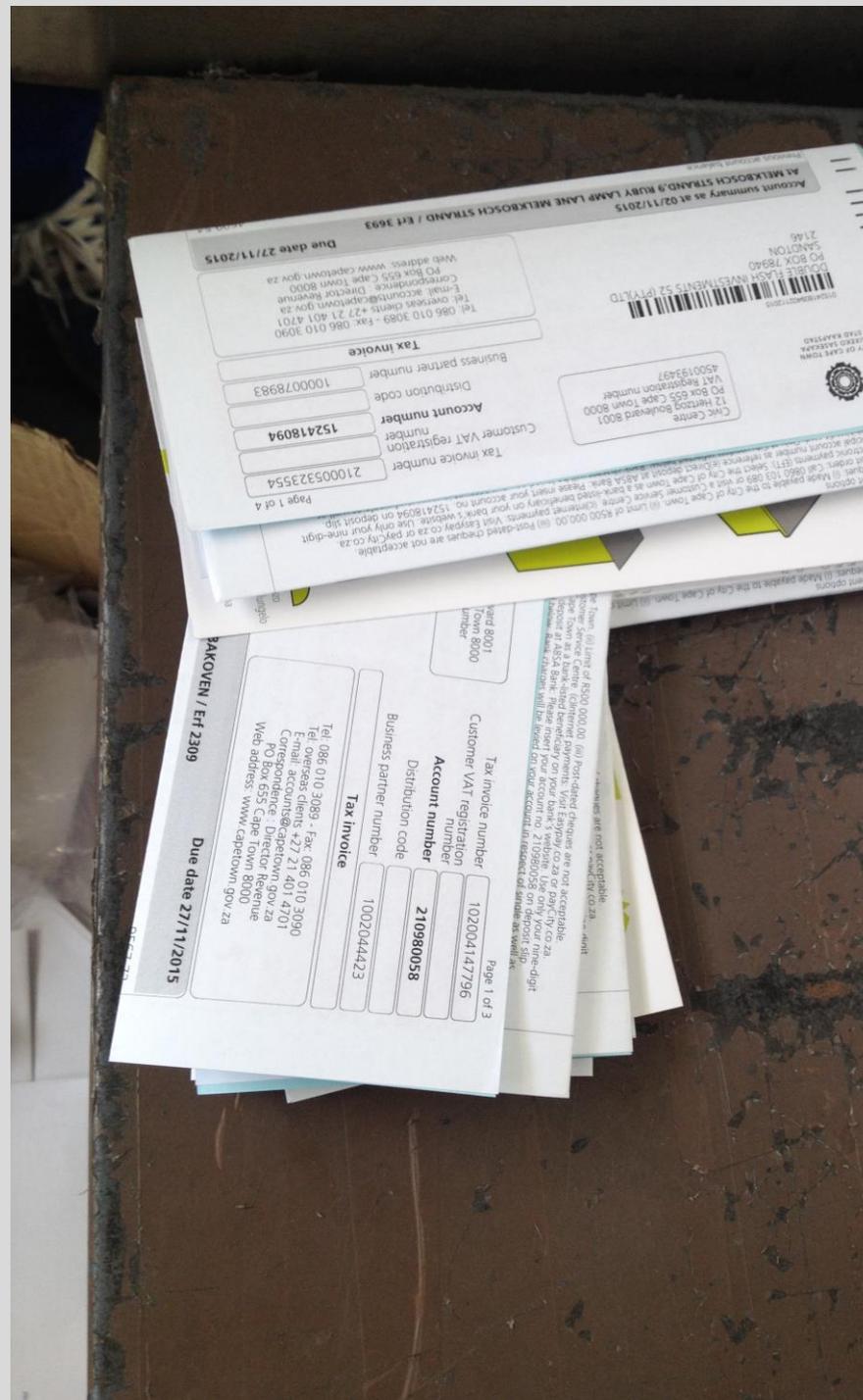
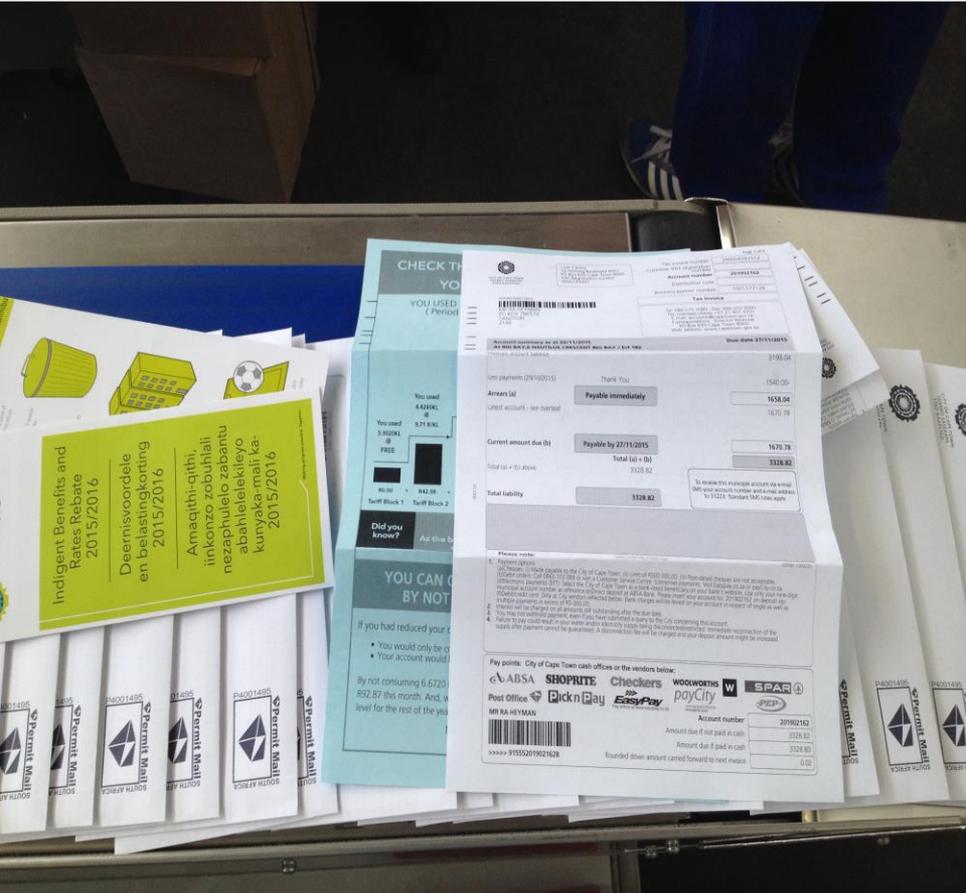
- Sent to individual households via billing inserts



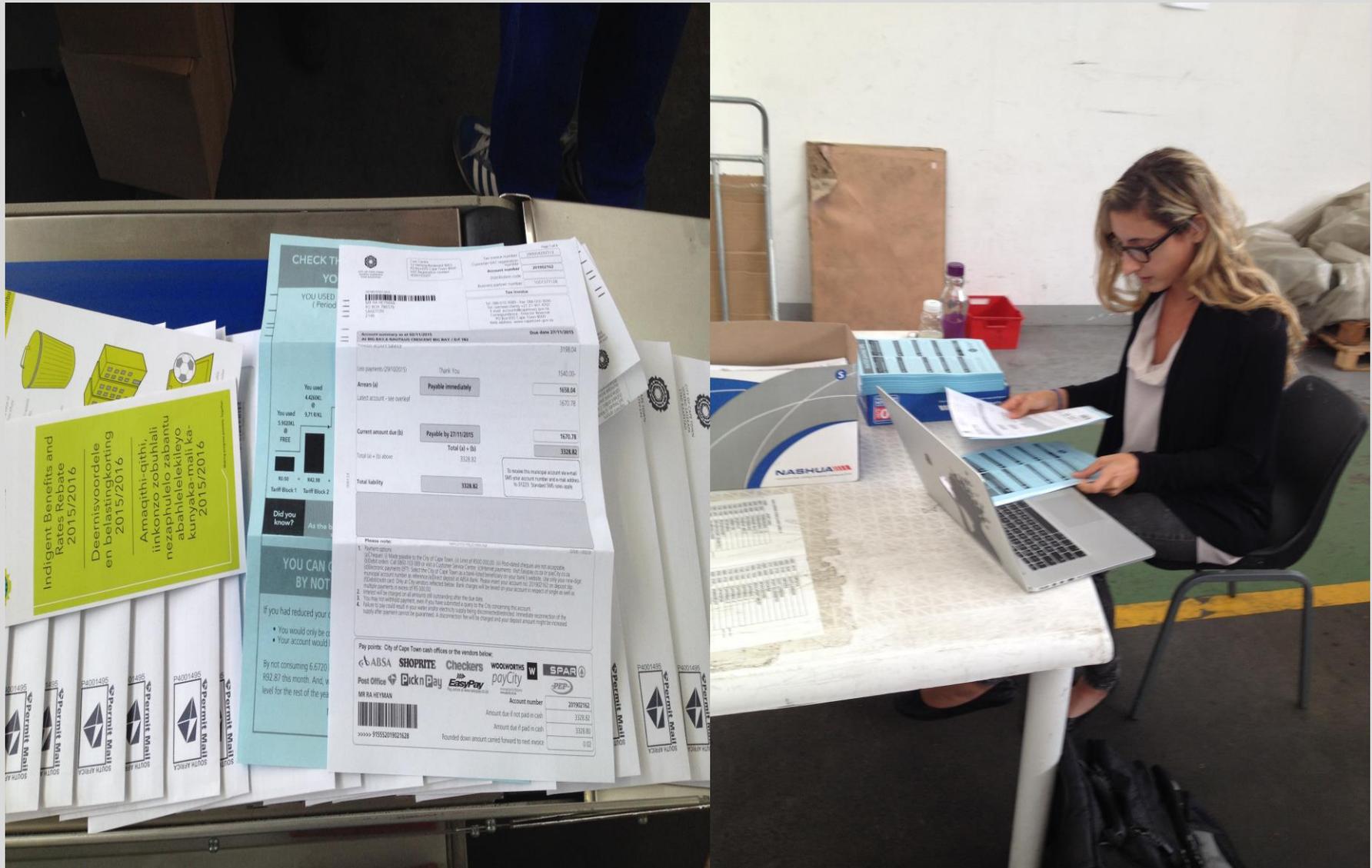
# Printing Process



# Printing Process



# Checking Inserts/ Quality Control



## **RESEARCH FINDINGS:** Behavioural billing inserts significantly decrease residential water consumption

- **Immediate impact on consumption during roll-out**
  - Inserts result in **average saving** of **2-3.5%** compared to control group
  - Inserts cost **less than 1c per household**
  - Range of nudges, such as ***financial, social norms, intrinsic and public goods motivation***, were effective in changing behaviour **across the middle and high-income households** spectrum
    - ***Social recognition*** particularly successful in motivating ***high income households (8-9% reduction)*** compared to control group

# TARIFF CHANGE vs BEHAVIOURAL NUDGES: Long term comparison between impacts of interventions

## Behavioural Nudges



## Tariff Increases



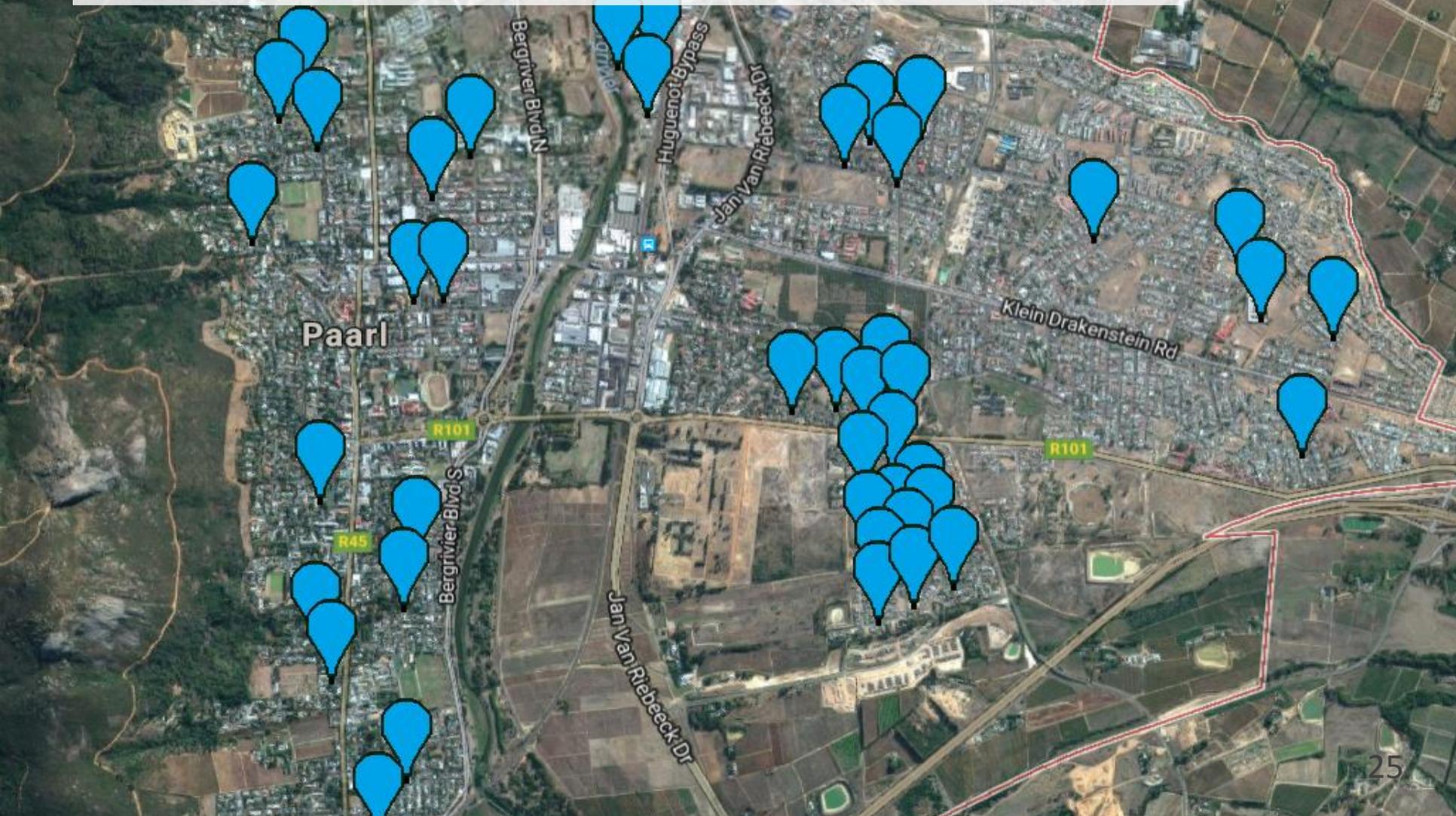
# PROJECT OPTIONS

Behaviour  
Change



# OPTION 1: WATER SAVERS MAP

Map website of households that are using less than recommended water amount per month



## **OPTION 2: INCENTIVIZE TAKE-UP OF SMART WATER METERS (Residential)**

*Run a limited promotion to subsidise Smart Water Meters for high water consumers*



## **OPTION 3: MOBILE APPLICATION**

*Promote use of Drop Drop amongst e-billers*



Thank You!

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