



Exploring Energy Use in Fashion Stores: A Field Experiment

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INDITEX

Stock information: Inditex 22/02/2019 17:35 CEST

Last: 25.53 €

Change: +0.10 (+0.39 %)

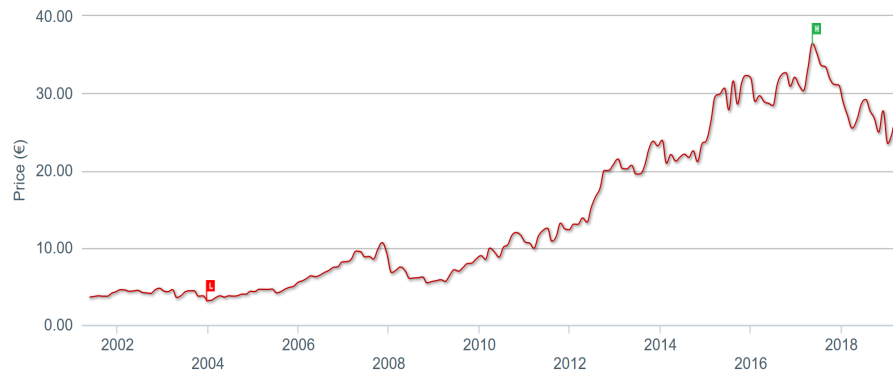
High/Low: 25.64/25.37

Yearly High/Low: 25.89/21.85

Volume: 2,252,792

Market cap: 79.57 bn

Today 1 mo. 3 mo. 6 mo. 1 yr 2 yr 5 yr All



INDITEX

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[HOW WE DO BUSINESS](#)

[INVESTORS](#)

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7,475

Stores

96

Markets

49

Online Markets

[Media](#)

[Careers](#)

[Contact](#)

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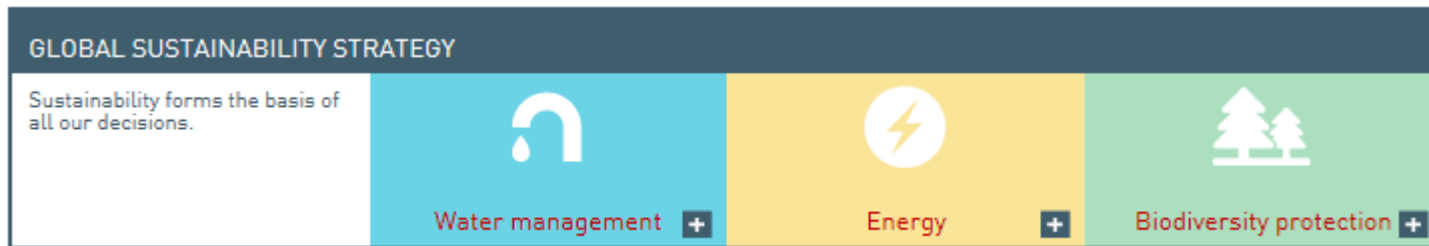
OUR FASHION IS
RIGHT TO WEAR

INDITEX

Experiment in 3 EU countries:
Spain, Italy, Germany



Sustainability in their global strategy



- Global Strategy to reduce emissions. It belongs to the Sustainable Apparel Coalition (SAC).
- It is expected that for 2020 will reduce emissions by 15% in the production process with respect to 2012, and a 10% in stores.

“The smart store” (tienda viva)

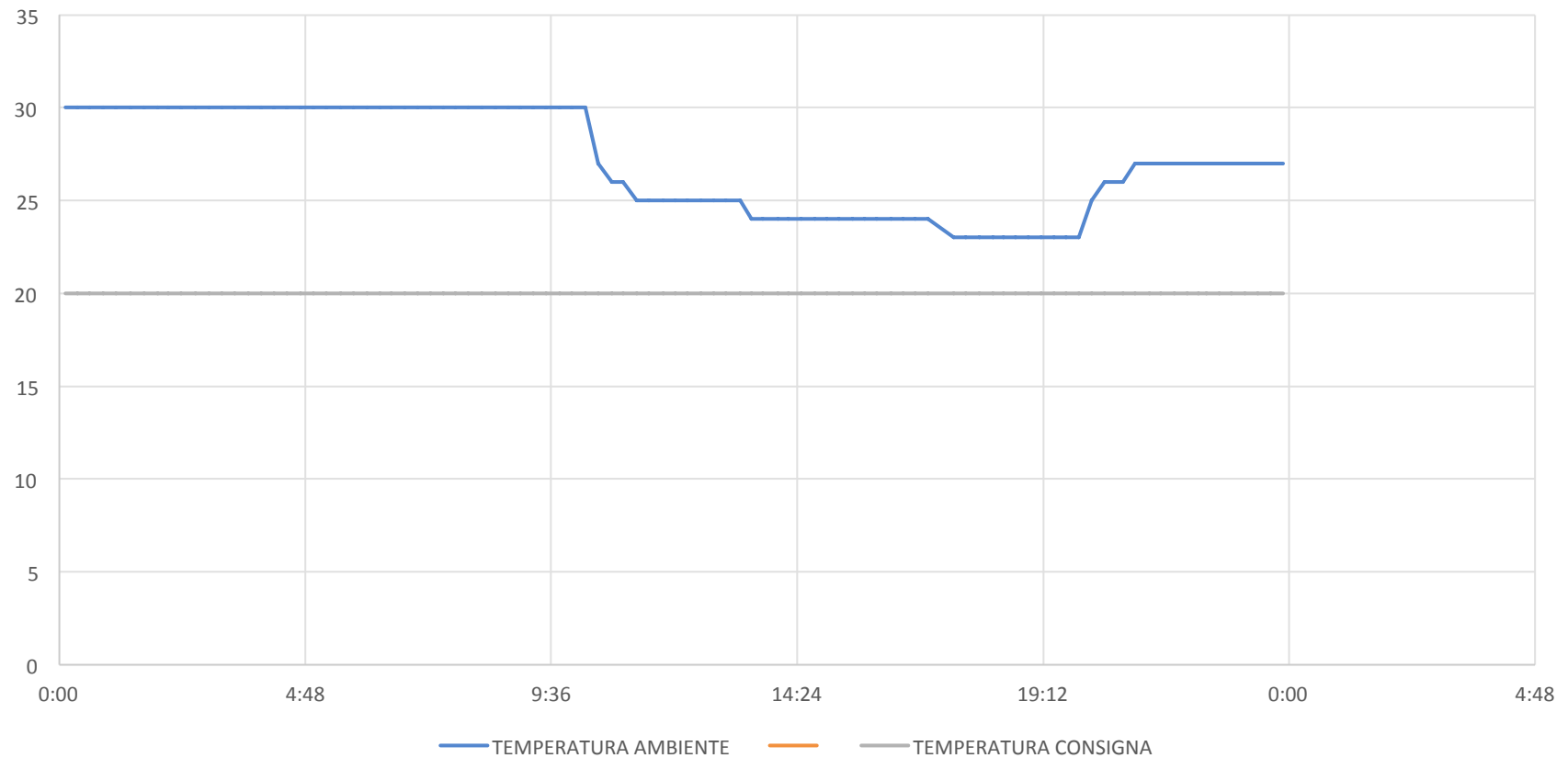
- Intensive updating and remodeling in stores
 - Eco-design
 - Light bulbs
 - Heating and cooling systems
- Sensors of movement, humidity, air temperature and air quality
- Automatized process

Heating and Coling Systems

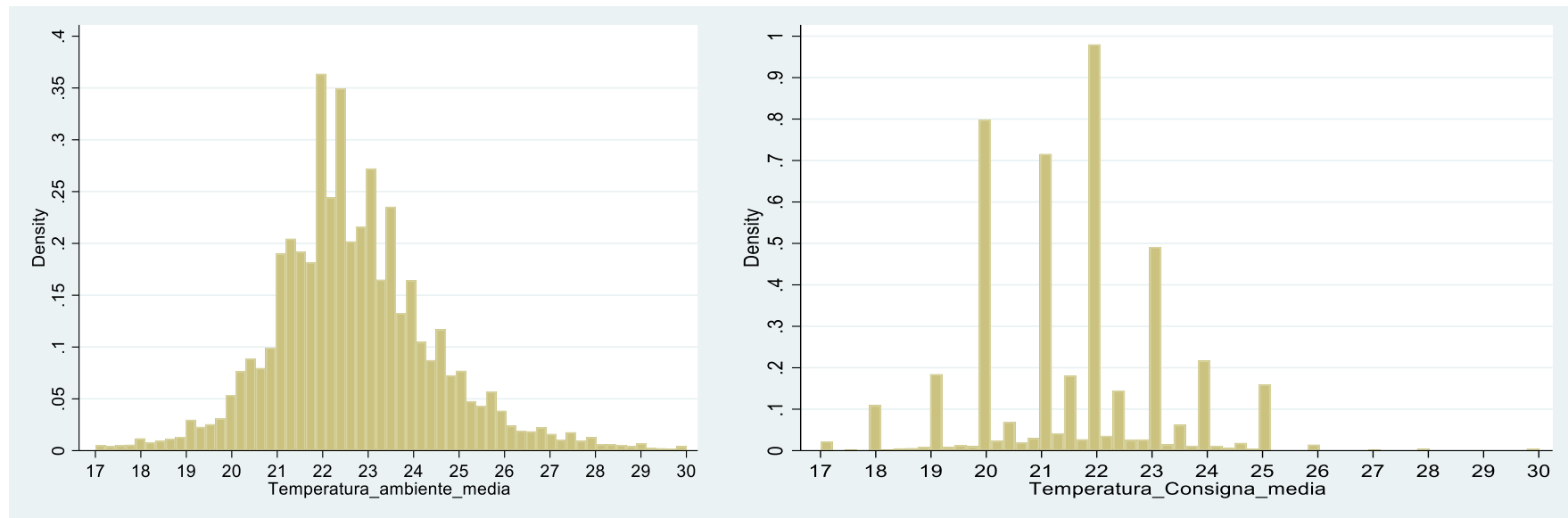
- Temperature is a key control variable
- Allow to set up a thresthold temperature:
 - Thresthold temperatures are established between 21-24 degree Celsius.
 - Thresthold temperatures can be changed automatically by managers
 - Energy efficiency issue: Establishement of indoor temperatures closed to external temperatures.

Some descriptive results: Venice (14/06/2015)

In-store Temperature and “Objective” Temperature



Average temperatures and threshold temperatures



Alta variabilidad de temperaturas de consigna y temperatura media interna

Mean temperature per month

Month	Media	Std. Dev.
1	21.984	12.394
2	22.229	14.834
3	21.778	11.232
4	21.720	10.720
5	21.380	12.431
6	21.304	13.036
7	20.859	14.477
8	21.016	17.114
9	21.412	15.655
10	21.563	13.232
11	21.600	13.060
12	21.835	11.534

Objective

- To assess the impact of information about environmental impacts of energy consumption in the retail sector in an international fast fashion group with a field experiment
 - Experimental subjects: retail managers
- To contribute to the literature in the business sector: A wide variety of field experiments in private households but quite novel in the context of retail sector

Energy efficiency gap in the retail sector: why?

- A significant energy efficiency gap may be present in the retail sector due to:
- Information asymmetries or lack of information (Howarth et al., 2000; Schleich & Gruber, 2008, Schlomann & Schleich, 2015)
 - Old infrastructures and buildings (Eichholtz, Kok and Quigley, 2013)
 - Other reasons (lack of incentives, etc) (Timilsina et al. (2016))
- Policy evaluation of intervention in Canada: Adams et al. (2011)



Data collection: Three brands in
three countries: Zara, Pull & Bear,
Oysho

Three countries: Spain, Germany
and Italy

- Different demand elasticities
- Different socio-cultural elements
and shopping habits

The experiment (RCT)

- Letter sent to store managers on February 3rd
- Information displayed during a week as “important message” in inbox
- Letter signed by the General Sustainability Director of the Inditex Group
- Content of this letter discussed by store managers and employees

The treatment: a letter

Dear manager,

Since some months ago we have been updating our stores with systems of measurement and management of energy in order to optimize energy consumption related to heating and cooling.

You should know that energy saving is crucial within the environmental objectives of our group INDITEX.

*In particular, the cost of **deviating 1 degree Celsius above or below the optimal inside temperatura, increases emissions in 4% caused due to a larger usage of electricity.***

*Please be aware that in order to contribute to **energy savings with the usage of the systems established, you can avoid the selection of an inside temperatura far away from the external temperature.***

Thank you for your consideration!

- *Sincerely,
Antonio Álvarez*
- *Director, Departament of Sustainability*

Message notification

The screenshot displays the TGT (Terminal de Gestión de Tienda) interface. At the top, the header shows the user's role as 'Señora' and 'Encargado/a', along with their email address 'Correo Señora: 3635' and 'Caballero: 5258'. The main content area is divided into several sections:

- Avisos:** A section on the left with a dropdown menu and a list of notifications, including 'Coordinación: Fotos', 'Aviso TGT', and 'RSC_IMPORTANTE'.
- Mensajería:** A central section showing a list of messages. A red arrow points from the message list to the detailed view of a message from 'Sustainability'.
- Calendario:** A calendar on the right showing the month of February 2016.
- Horario comercial:** A section on the right showing the commercial hours.
- Catálogo de artículos:** A section on the right showing a list of products.

The detailed view of the message from 'Sustainability' is shown below:

Enviado: Sustainability <correo@app.inditex.com>
A: -
CC: -
Fecha: Wed Feb 03 18:45:14 CET 2016
Asunto: RSC_WICHTIGE INFORMATIONEN

Ich schreibe Ihnen, um Sie darüber zu informieren, dass wir seit einigen Monaten an der elektrischen Verteilerschalttafel in Ihrer Filiale ein neuartiges System zur automatischen Kontrolle der Klimaanlage installiert haben. Dieses System hat das Ziel, den Komfort in Ihrem Laden zu steigern und den Energieverbrauch in Bezug auf die Klimatisierung zu optimieren.

Wie Sie ja wissen, ist die Energieeinsparung in Verbindung mit einer guten Steuerung der Klimatisierung fundamentaler Bestandteil der Umweltpolitik von Inditex. Zum Beispiel stellen die durch eine Abweichung um einen Temperaturgrad von der optimalen Temperatur in Ihrem Laden verursachten Kosten ungefähr eine Erhöhung der Stromrechnung und der CO2-Emissionswerte um 4% dar.

Denken Sie daran, dass durch einen vernünftigen Einsatz des installierten Steuerungssystems ein Beitrag zur Energieeinsparung und zur Verbesserung der Umwelt möglich ist, indem Sie bei der Temperaturwahl für die Ladenräume vermeiden, einen von der empfohlenen Ladentemperatur stark abweichenden Temperaturwert zu wählen.

Antonio Álvarez
Head of Environmental Sustainability
INDITEX

Message notification

The screenshot displays the TGT (Terminal de Gestión de Tienda) interface. The top header shows the store name 'tgt - Terminal de Gestión de Tienda - 500 - Señora - Dependiente/a' and contact information: 'Correo Señora: 3628 Caballero: 5251 Niños: 1'. The left sidebar contains sections like 'Avisos' (Notifications) and 'Incidencias Operativas' (Operational Incidents). The 'Avisos' section lists notifications such as 'Coordinación: Fotos' and 'Aviso TGT'. A red arrow points from a notification titled 'RSC_INFORMAZIONE IMPORTANTE' to a 'Consultar Mensaje' (Check Message) window. This window shows the date '2016-02-03', the subject 'RSC_INFORMAZIONE IMPORTANTE', and the message content 'VEDI ALLEGATO'. A red arrow points from the 'Fichero adjunto' (Attached file) section, which lists '222448963', to a detailed view of the message. The detailed view shows the text of the message, which is in Italian, and the signature of Antonio Álvarez, Head of Environmental Sustainability at INDITEX. The bottom of the interface features a navigation bar with sections like 'Sección', 'RECURSOS HUMANOS', 'COMUNICACIONES Y DOCUMENTACIÓN', and 'OPERACIONES Y DISTRIBUCIÓN'.

tgt - Terminal de Gestión de Tienda - 500 - Señora - Dependiente/a

Correo Señora: 3628 Caballero: 5251 Niños: 1

Avisos

02 mar Coordinación: Fotos

Aviso TGT

Hoy RSC_INFORMAZIONE IMPORTANTE

RSC_WICHTIGE INFORMATIONEN

Agenda

Consultar Mensaje

Día: 2016-02-03 Hora: Minutos

Asunto: RSC_INFORMAZIONE IMPORTANTE

Mensaje: VEDI ALLEGATO

Fichero adjunto: 222448963

Acceptar

Ca

Aplicaciones frecuentes

.01 Fotos coordinación .03 Catálogo de artículos

Sección

RECURSOS HUMANOS

COMUNICACIONES Y DOCUMENTACIÓN

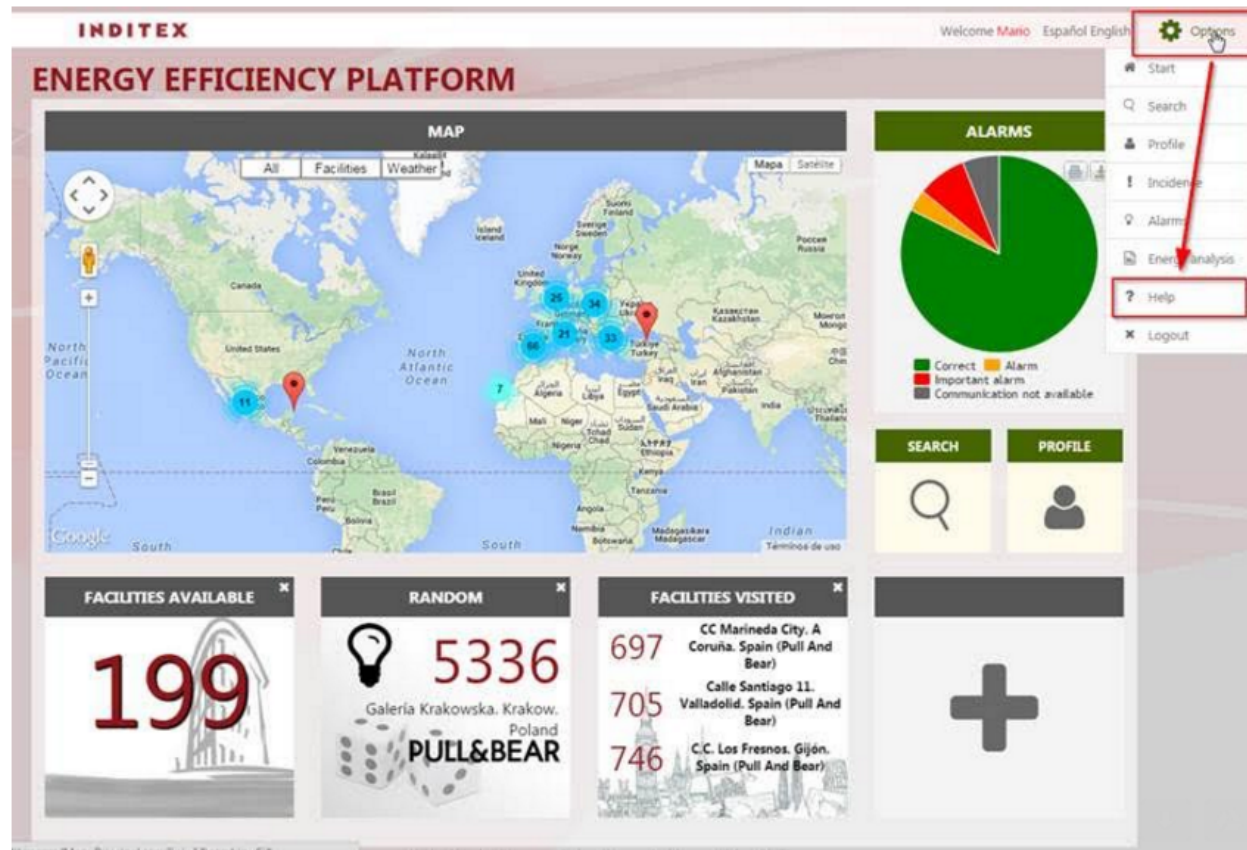
OPERACIONES Y DISTRIBUCIÓN

Antonio Álvarez
Head of Environmental Sustainability
INDITEX

The experiment

- Selecting treatment and control groups:
- They are all at street level and have a history of 1 year with the Eco-tool platform.
- We selected in Spain 20 Oysho, 20 Pull & Bear y 65 Zara stores, while an identical number are being used as control stores.

15' data frequency



Dataset Variables

- Energy consumption
- About the store:
 - Target temperature
 - Indoor temperature
 - Size of store (m2 and m3)
 - External temperature
 - Flagship store or not
 - Location
- About the manager:
 - Male/Female
 - Number of years of experience with the firm

Hypotheses

•Ho: Average engagement of managers in temperature control is identical between treated and non treated stores.

•Ho: Average differences between indoor and external temperatures are identical between treated and non treated stores.

Ho: Average engagement of managers is identical

Group	Number of changes	Std. Error
Non Treated	.898	.004
Treated	1.342	.007
	T-test	
Diference	-.443	.007
T-value (p-value)	-56.592 (0.000)	

Ho: No differences in temperatures between treated and non-treated

	Abs Difference between temperatures (Outside-Indoor)	Std. Error
Treated	6.630	
Non-Treated	6.680	0.0233
Difference	-.0500	.03003
T-value (p-value)	-1.6671 (0.0955)	

Non-Parametric Tests

Hypothesis	Kruskal-Wallis equality-of-populations rank te
(1) <i>Ho: Thermostat Changes (Treatment) = Thermostat Changes (Control)</i>	$\chi^2_{(1)}=41.945$ (p-value=0.000)
(2) <i>Ho: Indoor – Outdoor DifTemp (Treatment) = Indoor – Outdoor DifTemp (Control)</i>	$\chi^2_{(1)}=1849$ (p-value=0.000)

Difference-in-Difference Regression

$$Y_{lit} = \beta_{l0} + \beta_{l1} T_{lit} + \beta_{l2} A_{lit} + \beta_{l3} T_{lit} A_{lit} + \beta_{l4} Z_{lit} + \varepsilon_{lit}$$

Note: M1: modeling number of thermostat changes; M2: Model of the temperature gradient between indoor and outdoor temperatures

	M1			M2			
	Coef.	Std. Dev	P	Coef.	Std. Dev	P	
Email	1.969	0.087	0.000	2.073	0.073	0.000	
Product(DID)	1.523	0.097	0.000	-.1622	0.075	0.032	
year2016	-1.603	0.067	0.000	-1.316	0.049	0.000	
year2017	-0.727	0.077	0.000	-1.355	0.055	0.000	
Incharge	0.273	0.006	0.000	0.163	0.004	0.000	
Ms2	-0.0005	0.000	0.000	0.003	0.0001	0.000	
_cons	0.084	0.0733	0.000	2.561	0.0054	0.000	
F(6, 55925) = 567.27				F(6,35903) = 241.36			

What may justify our results?

- Behavioral inertias (as in private households)
- Lack of incentives
- Agency problems: managers do not have to pay energy costs.
 - Managers may have different interests than the firm.

Conclusions

- Significant steps towards emission reductions may be achieved with small behavioral changes
- Information may encourage reductions in electricity and emissions
- Small in-store reductions may generate large savings when scaled up
- Field experiments may help in order to reveal the true nature of inefficiency gaps in energy consumption in the retail sector.

Future research

- How to design incentives so that managers promote energy saving behavior?
 - Non pecuniary and reputational incentives
- What is the role of cultural differences in terms of temperature settings?
- How can we design most effective interventions by managerial types?

Further empirical questions

- Principal Agent theory: Do agents have incentives different than those from the principal?
- How to align different motivation between the agent and the principal?