

A photograph of a landscape with rolling hills. In the foreground, a large metal power line tower stands with several power lines stretching across the scene. In the background, several wind turbines are visible on the hills under a clear sky.

# ENCOURAGING HOUSEHOLD ELECTRICITY CONSERVATION

in Chisinau, Moldova

A graphic element consisting of a circular, multi-layered design with blue and white tones, resembling a stylized globe or a data visualization. The text "2019..." is overlaid on the left side of this graphic.

2019...



# ENCOURAGING HOUSEHOLD ELECTRICITY CONSERVATION in Chisinau, Moldova

Methodology: Cognitive Edge's SenseMaker® Narrative Enquiry tool

Authors:

Dumitru Vasilescu, Policy Specialist at UNDP Moldova

Jana Midoni, Project Officer at Moldova Innovation Lab, UNDP Moldova

Design/Layout: Ion Axenti

UNDP partners with people at all levels of society to help build nations that can withstand crisis, and drive and sustain the kind of growth that improves the quality of life for everyone. On the ground in nearly 170 countries and territories, we offer global perspective and local insight to help empower lives and build resilient nations.

All comments, questions and suggestions linked to the paper should be addressed to the authors at [dumitru.vasilescu@undp.org](mailto:dumitru.vasilescu@undp.org) and/or [jana.midoni@undp.org](mailto:jana.midoni@undp.org).

© Copyright 2020, UNDP.

All rights reserved.

Cover photo credit: freepik.

## CONTENT

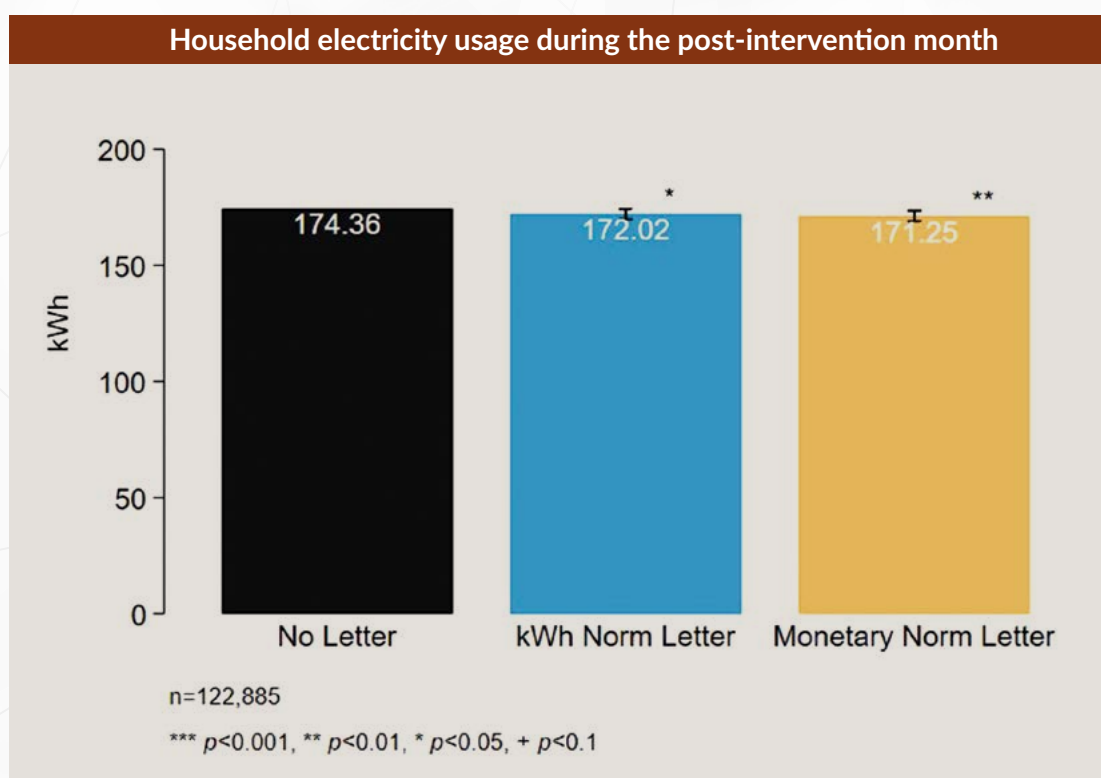
Overview .....	4
Trial Summary .....	5
Trial Results .....	7
Scaling-up and Policy Recommendations .....	8
Beyond Nudging .....	9
Appendix.....	10

## OVERVIEW

The United Nations Development Programme (UNDP) Moldova team partnered with the Behavioural Insights Team and the team of the local electricity distributor **to encourage households' conservation of electricity** in Chisinau, Moldova, in order to reduce harmful emissions put into the atmosphere by carbon-intensive power plants. Importantly for UNDP Moldova, reducing emissions by way of encouraging household energy conservation would contribute to UN Sustainable Development Goals 7 and 11: "affordable and clean energy" and "sustainable cities and communities," and serves as a first step to applying behavioral insights to energy conservation in the RBEC region and beyond. UNDP Moldova and Union Fenosa/Premier Energy, the electric utility company in Chisinau, entered into a Memorandum of Understanding to advance the sustainable development Agenda, with particular focus on the mentioned SDGs.

**To achieve this goal, the collaborators developed and tested two behaviorally informed letters that encourage households in Chisinau to save electricity.** Both letters use a social norm comparison to highlight how much more electricity a household uses compared to an "energy-efficient neighbor." We provide more detail on the design of these letters in the body of this report.

**We found that households that received either behaviorally informed letter reduced their electricity usage by approximately two percent** compared to households that did not receive the letter. The comparison message presented in terms of kilowatt-hours was equally effective as that presented in terms of a monetary amount in reducing electricity consumption.



The effect of the one-time letter intervention persists in the second and third month following our letter. **We continue to see statistically significant reductions in electricity consumption among households that received either letter compared to control households.**

Below we summarize the trial and suggest possible directions for scaling.

## TRIAL SUMMARY

We identified 127,760 households that used more electricity than average households during the first three months of 2019. Then, the Behavioural Insights Team randomly assigned these households to one of three groups. Group 1 received no letter and represented the status quo, as households currently do not receive letters from Union Fenosa/Premier Energy apart from their monthly bills. Groups 2 and 3 received different behaviorally informed letters from Union Fenosa/Premier Energy.

To determine whether our letters effectively encouraged households to save energy, we planned to compare individual household electricity usage data for households in Groups 2 and 3 with households in Group 1 in months one, two, and three following the letter.

Due to the cost of mailing and based on the required sample to determine whether our letters effectively encouraged households to save electricity, we sent about 10,000 letters each to Groups 2 and 3, leaving about 107,000 in Group 1.

**The following table summarizes the behavioral elements of each treatment letter.**

	Group 1	Group 2	Group 3
Sample Size	107.867	9.941	9.952
Message	No letter	kWh Norms Message	Monetary Norms Message
Personalization		✓	✓
Actionable energy saving tips		✓	✓
kWh social norms comparison		✓	
Monetary social norms comparison			✓

Thanks to the Behavioural Insights Team, the “kWh Norm” letter and “Monetary Norm” letter both had the following behavioral elements:

- 1) **Personalization:** We addressed the letters to recipients’ first name and highlighted their previous months’ energy usage or bill amount (“kWh Norm” Group or “Monetary Norm” Group, respectively) to increase the salience of the comparison with their energy-efficient neighbor; and
- 2) **Actionable tips with a checkbox:** We presented six actionable tips that Union Fenosa/Premier Energy recommends recipients to perform to save energy.

Additionally, the letters differed in the following ways:

- 3) **Social norms:** Both letters contained social norm comparisons, but they were framed differently. Receiving information about the behavior of others – social norms – encourages conformity among those who behave apart from the norm. This approach has been shown to reduce household electricity consumption in other contexts.<sup>1</sup>
- Group 2's "kWh Norm" letter presented the amount of electricity in kilowatt hours consumed by an "average energy-efficient neighbor" – defined as households that use less electricity than three-quarters of all Chisinau households – and compared it to a recipient household's electricity usage. This version of the letter replicated the key features of the OPOWER social norm intervention in a novel economic and geographic context.<sup>2</sup>
  - Group 3's "Monetary Norm" letter presented how much more money, in Moldovan Leu, a household spent on electricity compared to an "average energy-efficient neighbor." As far as we know, this is a novel iteration on the social norm comparison letters aimed at electricity conservation shared in the literature.

Both letters explicitly encouraged recipients to "make efficient use of electricity just like your energy-efficient neighbors."

Union Fenosa/Premier Energy mailed the letters across 4 weeks from May 22, 2019 to June 21, 2019 with the mailing schedule determined so that each household would receive the intervention letter around the time of its electricity bill.<sup>3</sup>

---

1. Allcott, H., & Rogers, T. (2014). The short-run and long-run effects of behavioral interventions: Experimental evidence from energy conservation. *American Economic Review*, 104(10), 3003-37.

2. Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics*, 95(9-10), 1082-1095.

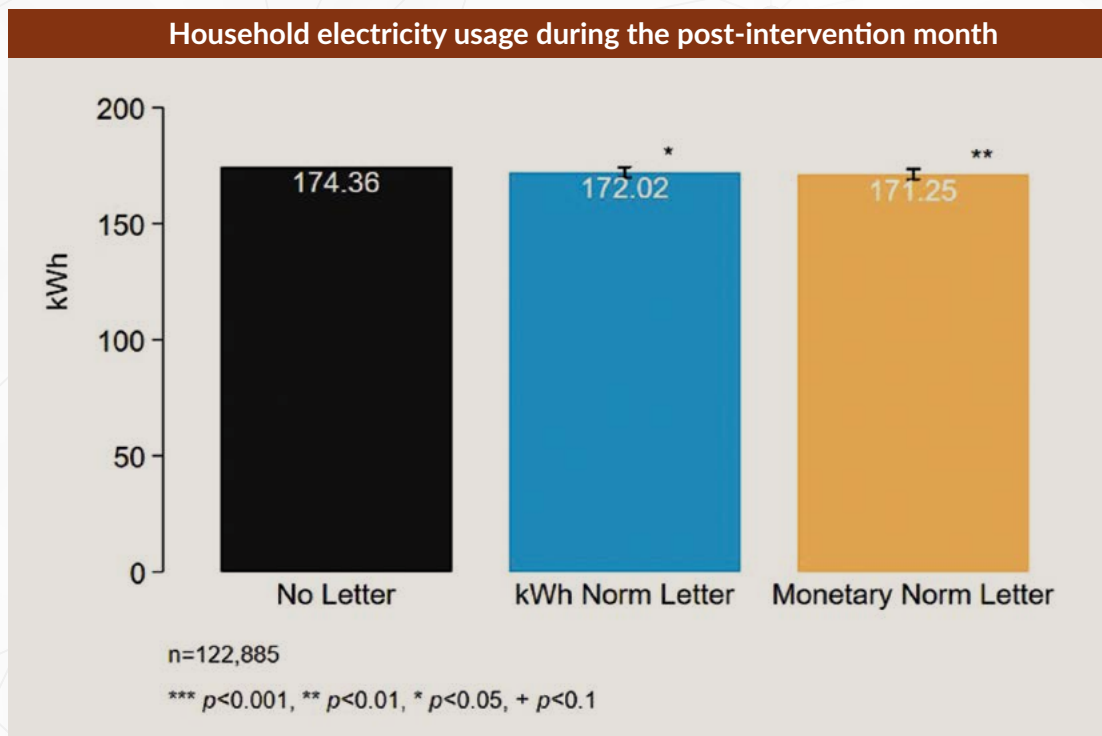
3. Union Fenosa/Premier Energy reported that 60 letters were returned due to technical reasons. We do not exclude these households from analysis.

---

## TRIAL RESULTS

The following points summarize the main findings from the analysis conducted by the Behavioural Insights Team:

- We found that, on average, **households that received either letter reduced their electricity consumption by about two percent in the following month** compared to households that did not receive a letter.<sup>4</sup> This effect size is in line with the effect size of similar interventions deployed in other geographies.<sup>5</sup>
  - The amount of energy saved on average by households receiving the “kWh norms” letter and the “monetary norms” letter are not statistically significantly different from each other. **In other words, while both letters worked, we cannot conclude that one worked better than the other**, even though households receiving the monetary norm letter appear to have saved slightly more.



- The effect size is stable even when excluding outlier households that consumed extremely high amounts of electricity in the past. Previous research suggests that high-energy consumers are likely to reduce a greater magnitude of energy usage than others, but we confirmed that the estimation of the intervention's effect size is not skewed by outlier households' behavior.

4. For analysis, we included 122,885 households that had an active electric utility contract status with a real electricity meter reading data at the time of data collection.

5. For example, see: Allcott, H., & Rogers, T. (2014). The short-run and long-run effects of behavioral interventions: Experimental evidence from energy conservation. *American Economic Review*, 104(10), 3003-37.

- **In the second and third month following our letter, we continue to see statistically significant reductions in electricity consumption among households that received either letter** compared to control households.
  - The kWh Norm letter reduced electricity consumption by 1.95kWh (1.7%) and 1.35kWh (1.5%) in the second and third months, respectively.
  - The Monetary Norm letter reduced electricity consumption by 2.76kWh (2.3%) and 1.89kWh (1.8%) in the second and third months, respectively.
- Over the course of three months in total, the households in “kWh Norm” Group and “Monetary Norm” Group conserved 119,411 kilowatt-hours of electricity compared to those who did not receive the letter. Such conservation represents the households saving 213,745 MDL (\$12,262.55) in energy costs while preventing production of 81,199 kg of CO<sub>2</sub> with a single additional letter<sup>6</sup> – equivalent to CO<sub>2</sub> emissions from burning 40,264 kg of coal.<sup>7</sup> We expect that scaling the intervention to every sample household would eliminate the equivalent of 263,395kg to 694,538kg of CO<sub>2</sub> emissions through electricity conservation over three months.
- Printing and mailing each letter costs Union Fenosa/Premier Energy 3.03 MDL (\$0.17). Thus, by mailing about 20,000 letters, this intervention incurred a cost of 60,600 MDL (\$3,390.81). This intervention therefore cost about \$41.76 to eliminate 1 ton of CO<sub>2</sub> emissions.

## SCALING-UP AND POLICY RECOMMENDATIONS

We recommend Union Fenosa/Premier Energy to pursue the following steps to encourage sustainable energy consumption behavior in Chisinau.

Given these results, we think the letter is a promising candidate for scale. In other words, it is recommended that Union Fenosa/Premier Energy **should send the “Monetary Norms” letter to households in Chisinau using more electricity than the average household**. After observing that households that receive the letter significantly reduce their electricity consumption for at least three months, we recommend sending the letter **on a quarterly basis**.

- As explained above, we did not find robust evidence that one letter outperformed the other. However, recipients of the “Monetary Norms” letter descriptively saved slightly more energy throughout the three months. In the case that Union Fenosa/Premier Energy wishes to send only one version of the letter in the future, we suggest sending the “Monetary Norms” letter in case the observed difference maintains at scale.

---

6. Union Fenosa/Premier Energy's internal CO<sub>2</sub> intensity estimates show that 0.68 kg of CO<sub>2</sub> are produced as a byproduct for every kWh of electricity produced.

7. This figure was computed using US Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator.

---



In light of the current low-cost evaluation's demonstrated success, we suggest that partners continue to iterate the intervention, if feasible. UNDP Moldova may be able to support Union Fenosa/Premier Energy to run an additional trial as they scale the letter. There is one particularly good candidate for a follow-up trial: test one of the proven social norms letters against **a modified electricity bill with an added social norm comparison** for households using more energy than the average household. If Union Fenosa/Premier Energy may be able to redesign their bills to incorporate a social norm comparison message that matches the comparison in our treatment letter (see appendix), this would save labor and logistical costs associated with printing and mailing additional letters. If a follow-up evaluation finds that a message on the bill is as effective as a separate letter, we would then recommend scaling this strategy, rather than send letters, in order to save money.

## BEYOND NUDGING

UNDP Moldova is committed to continuously advancing the agenda and ambition of conserving electricity in urban and rural contexts of Moldova. UNDP Moldova will contribute to the efforts to georeference electricity consumption in order to expand the list of possible experiments and understand how urban mobility and other factors influence electricity consumption. One of the possible urban experiments is to develop and test an educational program for students in schools and kindergartens to teach them how can encourage their family to conserve electricity.

UNDP will continue to use its big data urban cube to understand the relationship between electricity consumption and urban mobility. UNDP will also lead experimental efforts, such as adjusting the start of the working hours, improving public transportation, introducing social tariffs for most vulnerable groups of population, introducing new ideas, and testing new business models to switch to renewables, to reduce electricity consumption.

## APPENDIX

### "kWh Norm" LETTER

Dear <<first\_name>>,

We thought that you might be interested in the following information regarding your electricity use in 2019.

**Your average monthly electricity usage was:** <<kw2019\_monthly>> kWh

**Your average energy-efficient neighbor consumed:** 87 kWh

This means that you consumed on average <<kw2019\_kwh\_dif>> kWh more electricity per month than your average energy-efficient neighbor. We encourage you to make efficient use of electricity just like your energy-efficient neighbors.

Here are some tips you can learn to save energy right away. Check the box next to each action that you can do this month.



- Turn off the lights when not needed



- Turn off and unplug appliances like your TV when you are not using them



- Switch to LED light bulbs



- Use energy-efficient appliances (A+, A++, A+++)



- Wash only with a full load and use cold water washing if possible



- Don't leave the refrigerator door open for too long and reduce cooling setting to the midpoint if it is set colder than that

Yours truly, *Irina Gutu*  
Proiect Eficienta Energetica

### “Monetary Norm” LETTER

Dear <<first\_name>>,

We thought that you might be interested in the following information regarding your electricity use in 2019.

**Your average monthly electricity bill was:** <<kw2019\_monthly\_lei>> Lei

**Your average energy-efficient neighbor paid on average:** 156.80 Lei

This means that you paid <<kw2019\_lei\_dif>> Lei more per month than your average energy-efficient neighbor did because you consumed more electricity. We encourage you to make efficient use of electricity like your energy-efficient neighbors.

Here are some tips you can learn to save energy right away. Check the box next to each action that you can do this month.



Turn off the lights when not needed



Turn off and unplug appliances like your TV when you are not using them



Switch to LED light bulbs



Use energy-efficient appliances (A+, A++, A+++)



Wash only with a full load and use cold water washing if possible



Don't leave the refrigerator door open for too long and reduce cooling setting to the midpoint if it is set colder than that

Yours truly, *Irina Gutu*  
Proiect Eficienta Energetica



*Empowered lives.  
Resilient nations.*

**United Nations  
Development Programme**  
in Moldova

[www.undp.org](http://www.undp.org)