

Rewarding recycling through a smart city application

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Abstract

FOLLOWGREENTM is a digital application (platform – www.followgreen.gr) that rewards citizens who reuse or recycle at municipal level. It is a useful tool for Municipalities, as it motivates citizens through local market discounts and educates them -in a simple and entertaining way- at the same time. Schools also play a major role in the platform, as they actively participate in recycling competitions.

The main functions of the platform include:

- The citizens register as household users and *earn reward points* by being *educated* on environmental issues (reading articles, solving quiz and watching videos) and by *registering their day-to-day recycling activities*.
- The citizens can then *redeem their reward points for special discounts* in local shops and municipality services, or *donate points as support to local schools* in the framework of recycling school contests.

The platform was initially launched in December 2016 in one Greek Municipality (Municipality of Pallini) and now it has been expanded to other four Municipalities covering a population of 360.000 inhabitants. After one year of implementation, the results can be summarized below:

- ~ 2.200 households registered
- ~150 special offers from local market available
- ~ 80.000€ sales with special discounts through the platform
- ~11.000 pupils participated in recycling school contests.
- ~100.000 kg of paper/plastic/metal/oil/batteries recycled in schools.
- 20 online educational sessions taken place on average per user.

FOLLOWGREENTM enhances the local economy with significant environmental and social benefits for citizens and the municipality. It is thus a digital application for “smart” cities and communities bringing together Municipalities, citizens, local businesses and schools in order to boost recycling.

Keywords

Smart city application, Recycling, Reward, Followgreen, Platform, PAYT

Introduction

In typical Pay As You Throw (PAYT) schemes, households are charged based on the amount of waste they generate, while a variety of models exist around the world. Some of the PAYT schemes include a combination of flat rate fees or taxes (e.g. certain annual amount) and a variable element linked to container sizes (volume-based schemes), number of sacks (sack-based scheme), frequency of collection (frequency-based scheme) or the weight collected (weight-based scheme) or a combination of these elements. PAYT is usually applied to mixed residual waste, however it can also include bio- and garden waste or paper waste.

The intention of such a system is that the separate collection of recyclable materials such as biowaste and recyclables is (partly or completely) cross-financed by a higher charge for residual waste. Usually, the collection of source-separated dry recyclables in a PAYT scheme is free of charge for the citizen, and collection of these materials cross-financed by the fees on residual waste collection.

In Greece and in many other countries in the EU, PAYT is very difficult to be applied due to local circumstances and Municipalities are unable to motivate citizens towards a circular economy model. *Followgreen* is a contemporary digital tool for Municipalities to reward citizens who promote reuse and recycling. It goes beyond the PAYT (Pay as you throw) systems, as it motivates and educates citizens at the same time, while it brings together Municipality with citizens, schools and local market under the umbrella of circular economy.

The platform was initially launched in December 2016 in one Greek Municipality (Municipality of Pallini) and now it has been expanded to other four Municipalities (Municipality of Vrilissia in February 2017, Municipality of Loutraki in September 2017, Municipality of Ioannina in March 2018 and Municipality of Peristeri in April 2018) covering a population of 360.000 inhabitants. Municipalities can lease the platform for a certain time period being accompanied by continuous technical support (marketing, organization of school recycling

contests, communication with local businesses etc.). Although the platform is still only in Greek, there is an English version to be launched within the next years.

Methods

Followgreen is an online platform which operates as a loyalty programme and citizens can earn and redeem points. In brief, citizens can:

- **create an online user account on www.followgreen.gr**, by adding their home address. They should belong to a Municipality which co-operates with Followgreen, in order to register.
- **earn points by reading articles, doing quiz and watching videos** related to recycling and environmental protection in general.
- **earn points by declaring their reuse or recycling activities in their Municipality** either through a recycling coupon (e.g. when they deliver an item to the Social Infrastructures) either through a recycling reminder form. More specifically, rewarding coupons are provided to citizens when they deliver old items (e.g. books, clothes, furniture, toys, etc.) for reuse or recycling to dedicated areas indicated by the Municipality. By entering the unique code (written on the coupon) on the platform, the user can earn 150 points.
- **redeem points for discounts in local shops** (the shops have to operate within the Municipality) **or municipal services** (athletic and cultural activities, summer camps, etc.).
- **donate points to schools in order to support them in recycling activities**. Usually these activities concern competitions for recycling (paper, metals, plastic, WEEE, batteries, etc.) taken place in a certain time period for all schools in the Municipality.



Figure 1: How Followgreen works

The four main functions of Followgreen are analysed in the next paragraphs.

1. Earning points through environmental education

Citizens can register and **earn points by reading articles, doing quiz and watching videos** related to recycling and environmental protection in general, on the special page “Earn Points”.

Each selection (article, quiz, video) gives a number of reward points, which are added in the personal account of the users.

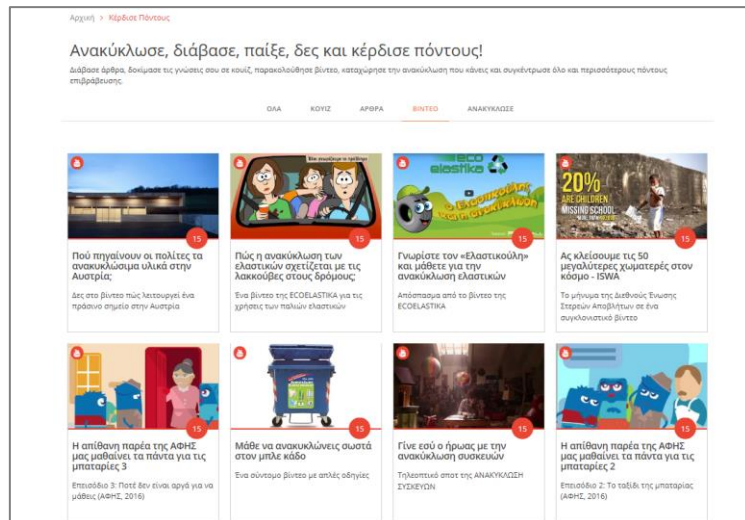


Figure 2: Earn points page

Gamification and education in an easy and entertaining way is the main goal of Followgreen. Indicatively, there are many quizzes for self-testing someone's knowledge and skills on recycling. In addition, there are many cases with decoration ideas promoting a circular economy model.

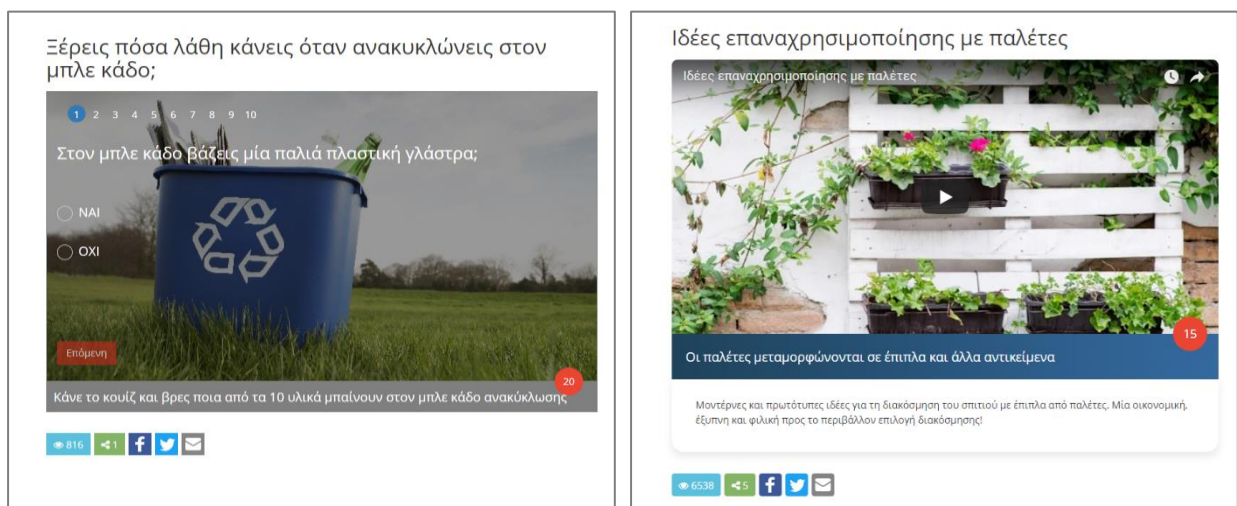


Figure 3: Earn 20 reward points by solving a quiz (left) and 15 points by watching a video (right)

2. Earning points through recycling and reuse

The core element of the platform is that citizens can **earn points** by reusing or recycling in selected points/areas in the Municipality.

There is an online map with the recycling points of different materials (such as electrical appliances, batteries, etc.) and social infrastructures where someone can deliver old furniture, clothes, household items, medicines, books, games etc. This tool can assist citizens to find out quickly the nearest point of interest.

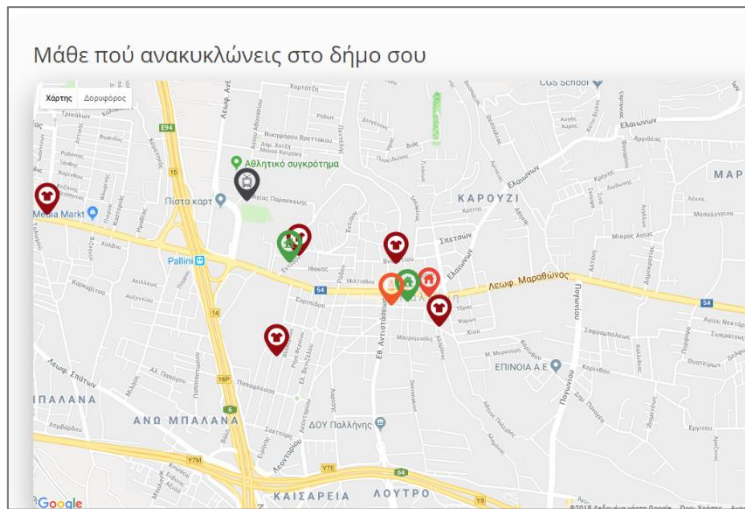


Figure 4: Local map with available recycling points

In certain areas/points, the citizens can receive a recycling coupon, i.e. Followgreen coupon, which has a unique code, automatically generated by the system, as presented below. By entering the unique code (written on the coupon) on the platform, the user can earn 150 points.

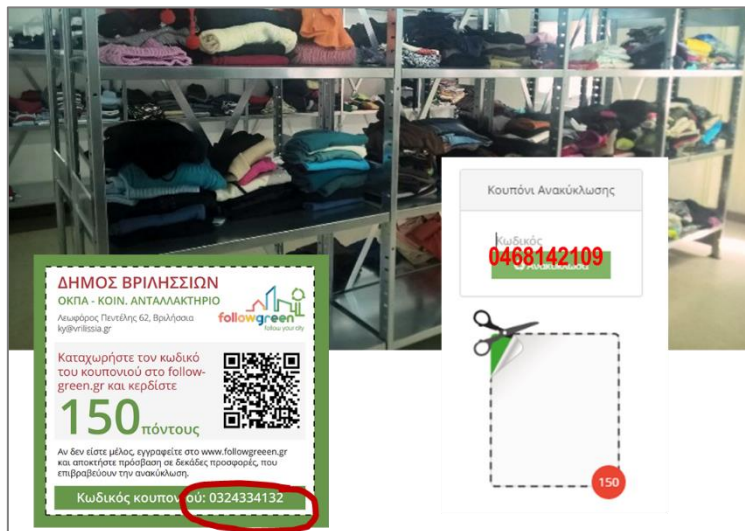


Figure 5: Recycling coupon

Apart from this, points can be earned by declaring your activities through a recycling reminder form.

3. Redeem points for discounts in local market

The points added in the personal account of the users can be redeemed for special discounts in municipality services (eg. municipal transportation tickets, athletic or cultural programmes, kid's camps etc.) or local shops. All offers concern discounts either on products or services and are grouped in 10 main categories: fun/sports, clothing/ footwear, restaurants/coffee shops, health/beauty, retail shops, house & office equipment, public services, education, vehicles/fuels and others.

By selecting an offer, the users as well as the local shop, receive a coupon (through email) with an identification number, while the points are removed from users' account. In most cases, the offers correspond to a range of 75 to 500 points, depending on the value of the discount. The coupon can be used within 21 days.

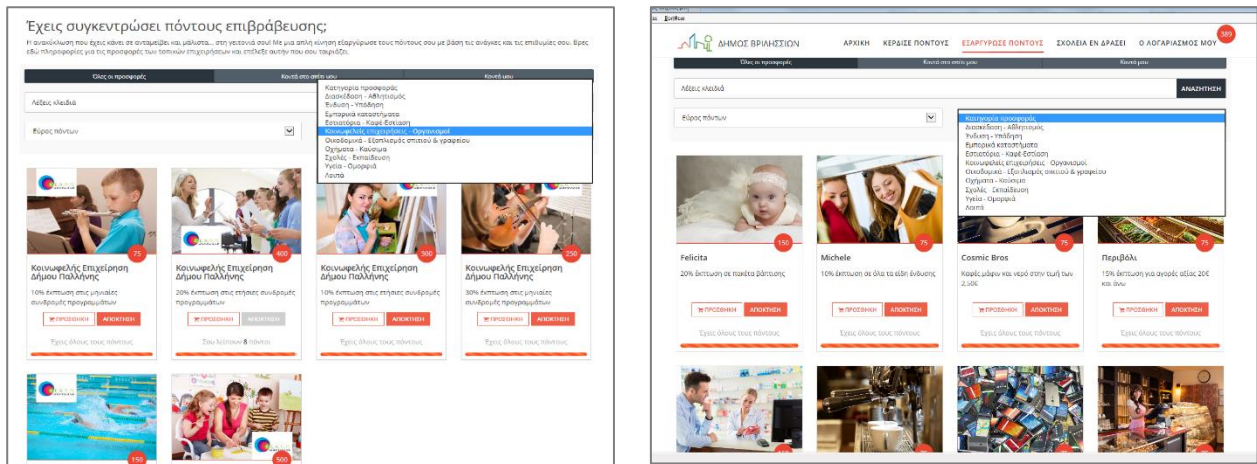


Figure 6: Indicative offers provided by the Municipality (left) and local shops (right)

4. Redeem points to support school recycling competitions

In the framework of Followgreen, each Municipality organizes **annual recycling competitions** in primary or/and secondary schools. Each school is supplied with the necessary equipment for the separate collection of recyclable materials. These materials include paper, aluminum, plastic, WEEE, batteries and used edible oil which students bring from their homes. In this way, parents together with children are educated and participate in separate collection and recycling. The materials are then weighed and each school earns a number of points per kilo. The “recycling” performance of all schools is available online, allowing any visitor to monitor the progress and get informed.

In addition, online users such as parents, teachers or any other citizen can donate points to schools, supporting their efforts on recycling.

The online page, showing each school performance together with the donation button is illustrated below.

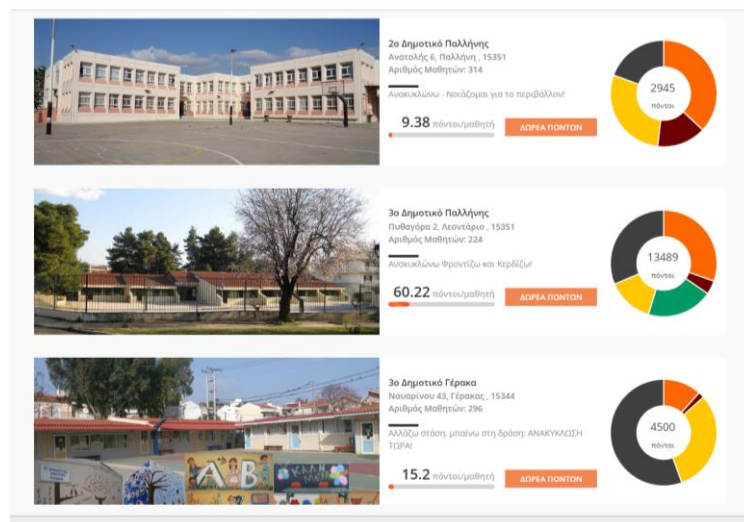


Figure 7: Followgreen page illustrating schools' performance on recycling competitions

Another innovative characteristic of Followgreen in schools, is that it hosts *School Competitions requiring public votes*. A school competition for *Painting municipal waste bins* was organized in the Municipality of Pallini, where 13 secondary schools participated. Through the platform, all student drafts were posted anonymously and a public vote took place for the best proposal.

In this way, the school community was actively involved in raising citizens' awareness while participating in an effort to make cities smarter and more environmental friendly.



Figure 8: Followgreen page illustrating schools' posts for online voting

Results and Discussion

The platform has been applied and tested in three Municipalities almost one year with significant results, indicating that rewarding schemes are always welcome by citizens. Followgreen™ provided Municipalities with a contemporary digital tool to reward 'green' citizens who promoted reuse and recycling by receiving discounts in local businesses. In a simple and entertaining way, citizens also got educated on environmental issues, while schools obtained a key role in Municipality's recycling programmes.

For three Municipalities (Municipality of Pallini – Municipality of Vrillissia – Municipality of Loutraki), the results in the beginning of 2018 can be summarized below:

- ~ 2.200 households were registered as users or 5,5% of the total households.
- ~ 18.000 unique visitors in the platform (15% of the population).
- ~150 special offers from local market were available.
- ~ 80.000 euros sales were realized with special discounts by redeeming points.
- ~11.000 pupils participated in the recycling school contests.
- ~100.000 kg of paper/plastic/metal/oil/batteries were recycled in the schools in a 9-month period.
- 20 educational sessions (article reading, quiz solving, video watching) on average per user were realized.

Environmental benefit

Followgreen™ aimed at the improvement of the environmental footprint of Municipalities by promoting to the citizens a sustainable model of living, initially through reuse and recycling.

For the Municipality of Pallini (*50.000 inhabitants or 19.000 households*) which has completed the first year of application, the results show clear evidence on the impact of Followgreen™ to the local community.

- **530** citizens-users delivered old items for reuse to the municipal social infrastructure (e.g. books, clothes, furniture, toys, etc.) receiving a Followgreen coupon. These items avoided landfilling with direct and indirect environmental impacts.
- **100.000kg** of paper/plastic/metal/oil/batteries were recycled in sixteen schools of the Municipality of Pallini in a 9-month period.
- **840** citizens-users of the platform declared that are committed to recycling in the dedicated areas indicated by the Municipality.
- **1829** households were registered as users to the platform, **3.900** pupils participated in the recycling school contests and therefore **7.800** parents/citizens were informed and raised environmental awareness through recycling actions with direct and indirect impacts on waste generation and source separation.

Social benefit

Followgreen™ also creates **social benefits** for citizens and municipality by:

- **promoting and rewarding reuse** of useful items and objects (e.g. books, clothes, furniture, toys, etc.) at the municipal social infrastructures, **assisting in this way socially vulnerable groups**. Indicatively, the social infrastructure of the Municipality of Pallini assists approximately 500 families which live in poverty,

- providing the opportunity to **citizens to have discounts** on products or services at local market and discounts on municipal services (summer camps, cultural events etc.)
- **providing environmental awareness and education** -in a simple and entertaining way- and experiential learning at schools through school recycling contests.
- **supporting social coherence** as it actively involves and interconnects all stakeholders in a local community.

Conclusions

The online platform followgreen.gr is a digital application for “smart” cities and communities bringing together Municipalities, citizens, local businesses and schools in order to boost reuse and recycling.

On the platform, the citizens i.e. users earn points by being educated on environmental issues and by certifying their recycling activities. They can then redeem their points for discounts in local shops.

It is a useful tool for Municipalities, as it is an innovative reuse/recycling rewarding scheme, which motivates citizens through local market discounts and educates them -in a simple and entertaining way- at the same time. As a result, it enhances the local economy with significant environmental and social benefits for citizens and the municipality.

Followgreen™ belongs in smart city applications and can be widely used in many fields of circular economy. However, the most important element of the platform is that it actively involves schools (students and parents) in circular economy thinking allowing their active participation.

The platform addresses Greek Municipalities and till today five Municipalities are actively involved, including the Municipality of Pallini, the Municipality of Vrilissia, the Municipality of Loutraki, the Municipality of Ioanniton and the Municipality of Peristeri.