

Social Electricity

Energy Awareness through Social Comparisons



Dr. Andreas Kamilaris
Dept. of Computer Science, University of Cyprus

Joint Coordination Activity on ICT and Climate Change
ITU Headquarters, Geneva, Switzerland

5th February, 2013

Problem Statement



In most European countries, including Cyprus, people receive an electricity bill once every month. It is not easy for them to perceive their electricity footprint, i.e. to understand whether their consumption is low, medium or high.

Citizens need an effective way to realize the “semantics” of their electrical consumption!



Motivation

Social Norms

“People tend to follow what other people do and adapt their behaviour and practices according to the stimuli received by their friends, relatives and neighbours”.

“Social norms can motivate people to question their attitude, if they discover it is not ”normal”.



“Social influence is an important factor that motivates people to change their lifestyles”.

“People are willing and capable to adapt their behaviour to energy-saving lifestyles if given the necessary feedback, support, and incentives”.

General Idea



Energy Awareness through Social Comparisons



Social comparisons may enable people to perceive the amounts of their consumed electrical energy, by comparing it with their social and local environment!



Online social networking sites constitute promising platforms to locate people and discover their social networks.

Social Electricity

The left screenshot displays the user's profile and energy consumption data for themselves and their friends:

- Anastasia Georgiou**: Town/Village: ΑΕΥΚΩΣΙΑ, Ave. Consumption(kWh): 522.06, Ave. Cost(€): 132.06
- Makis Kazakeos**: Town/Village: ΑΕΥΚΩΣΙΑ, Ave. Consumption(kWh): 571.09, Ave. Cost(€): 144.27
- Nikolas Antoniou Viridis**: Town/Village: ΑΚΑΤΑΜΙΑ, Ave. Consumption(kWh): 581.76, Ave. Cost(€): 146.92
- George Taliadoros**: Town/Village: ΣΤΡΟΒΟΛΟΣ, Ave. Consumption(kWh): 594.13

The right screenshot displays the top 10 greenest areas in ΑΕΥΚΩΣΙΑ:

| Area | No. of houses | Ave. Consumption(kWh) | Ave. Cost(€) | Standard Deviation |
|------------------------|---------------|-----------------------|--------------|--------------------|
| ΜΟΥΤΟΥΛΛΑΣ | 8 | 443.75 | 110.49 | 98.68 |
| ΣΥΝΟΙΚΙΣΜΟΣ ΑΝΘΟΥΠΟΛΗΣ | 494 | 521.13 | 131.83 | 208.11 |
| ΠΥΡΓΟΣ ΚΑΤΩ ΤΙΛΛΙΡΙΑΣ | 251 | 567.49 | 143.37 | 275.12 |
| ΠΕΔΟΥΛΑΣ | 7 | 578.28 | 146.06 | 478.37 |
| ΦΛΑΣΟΥ ΚΑΤΩ | 32 | 599.84 | 151.42 | 357.5 |
| ΦΛΑΣΟΥ ΠΑΝΩ | 44 | 602.95 | 152.20 | 321.01 |
| ΑΓΙΟΣ ΔΟΜΕΤΙΟΣ | 3484 | 604.57 | 152.60 | 345.17 |
| ΠΑΛΑΙΧΩΡΙ ΟΡΕΙΝΗΣ | 74 | 607.01 | 153.21 | 273.28 |
| ΓΑΛΑΤΑ | 142 | 608.18 | 153.50 | 305.04 |
| ΦΑΡΜΑΚΑΣ | 77 | 608.46 | 153.57 | 219.79 |

The right screenshot also includes a pie chart showing the distribution of energy consumption across the areas and a legend for the Green Areas:

- ΜΟΥΤΟΥΛΛΑΣ
- ΣΥΝΟΙΚΙΣΜΟΣ ΑΝΘΟΥΠΟΛΗΣ
- ΠΥΡΓΟΣ ΚΑΤΩ ΤΙΛΛΙΡΙΑΣ
- ΠΑΛΑΙΧΩΡΙ ΟΡΕΙΝΗΣ
- ΠΕΔΟΥΛΑΣ
- ΦΛΑΣΟΥ ΚΑΤΩ
- ΦΛΑΣΟΥ ΠΑΝΩ
- ΑΓΙΟΣ ΔΟΜΕΤΙΟΣ
- ΓΑΛΑΤΑ
- ΦΑΡΜΑΚΑΣ

Social Electricity Facebook application helps Cypriot citizens to understand their consumed energy, through comparisons with their own neighbourhood and their online friends!



Electricity data is real and accurate, provided by the Electricity Authority of Cyprus.



Electrical information is aggregated in neighbourhood level (PO code, street).

Data Volume

300,000 domestic premises

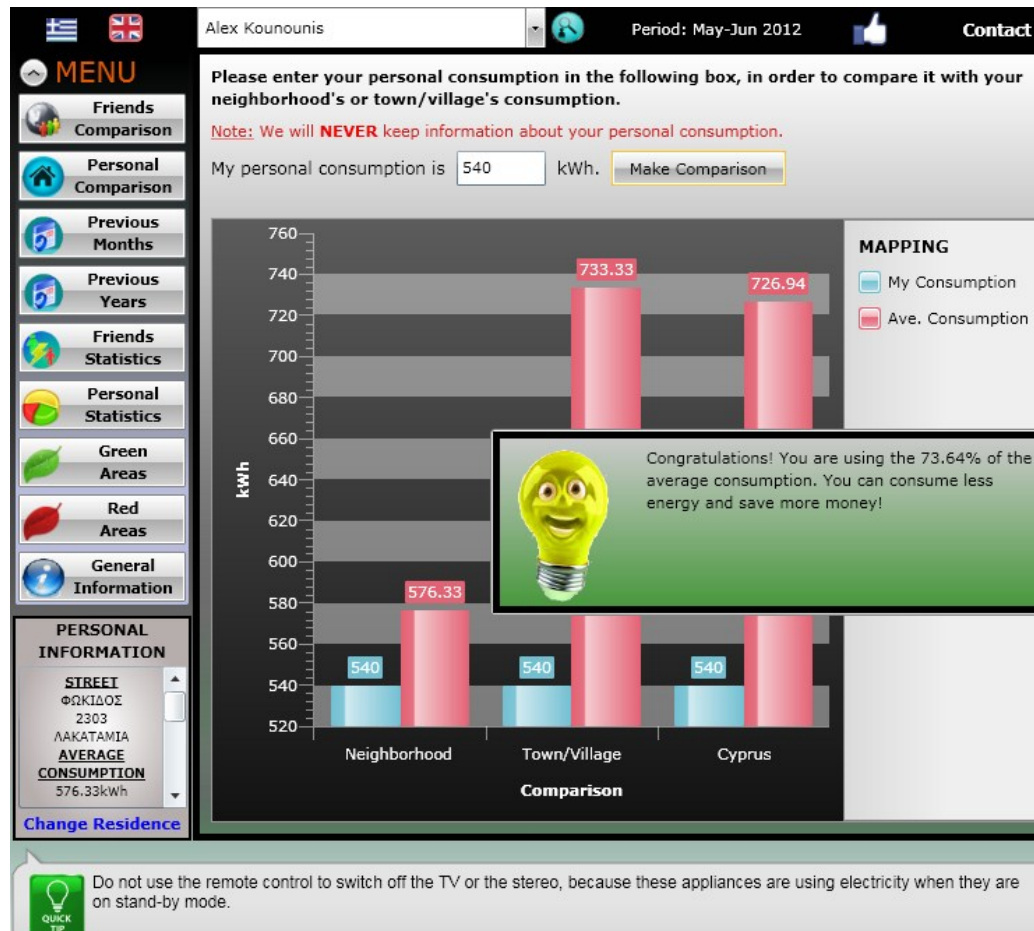
2-month periods



2-year historical information

7.200,000 electricity measurements

Features I



Personal Comparisons: Compare your own electricity footprint with the average amount of electricity consumed at your neighbourhood, village/town or the whole of Cyprus.

Features II

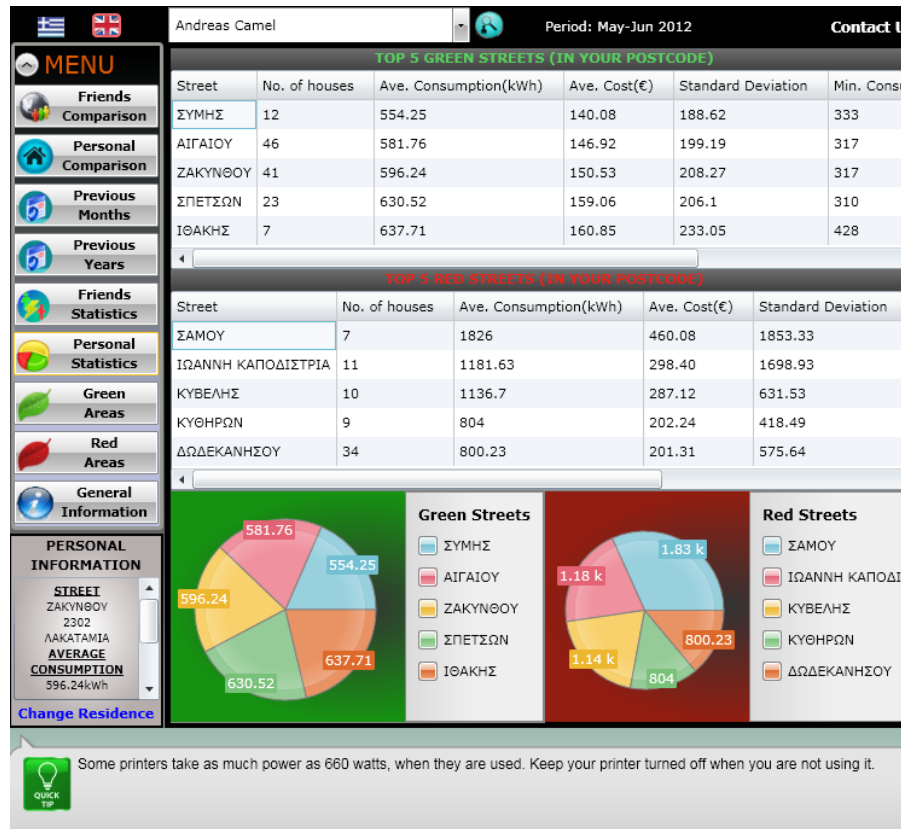
The screenshot displays a map application interface for Cyprus. On the left, a sidebar menu includes options like Search, Friends, Friends Comparison, Personal Comparison, Previous Months, Friends Statistics, Personal Statistics, Green Areas, Red Areas, and General Information. Below the menu is a 'PERSONAL INFORMATION' panel with fields for STREET (ZAKYNGOY 2302), AAKATAMIA, AVE. CONSUMPTION (1009.1kWh), and AVE. COST (€88.82). The main map area shows a topographic view of Cyprus with various cities and roads labeled. A green box highlights a specific location, which is expanded into a detailed street view popup on the right. This popup shows a street view image of a red car and a data box with the following information:

- Street: 1ΗΣ ΑΠΡΙΛΙΟΥ
- Town/Village: ΑΛΑΜΠΡΑ
- Number of Houses: 4
- Average Consumption: 407.50kWh
- Average Cost: €34.92

At the bottom of the interface, there is a 'QUICK TIP' section with a lightbulb icon and the text: 'A 10,000-BTU air conditioner consumes 1,200 watts per hour. If you are using it for 12 hours a day, and only for one room, that consumes energy of 12000 watts. You can save money by using a floor fan that consumes 100 watts or a ceiling fan that consumes 15-95 watts.'

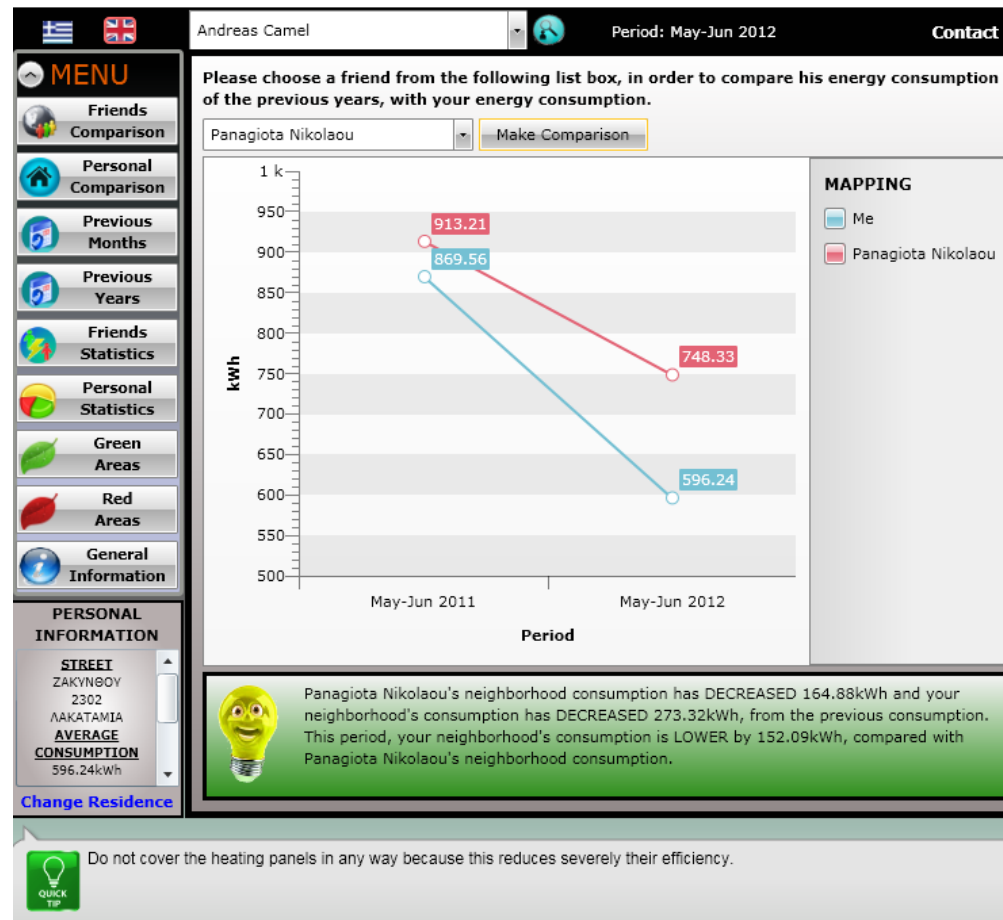
Social Comparisons: Compare the electrical consumption at your street with that consumed by the streets of your friends, who are tagged on the map of Cyprus where they live.

Features III



Location-based Statistics: Observe the most and least energy efficient streets in your neighbourhood as well as the most and least energy efficient areas and villages around Cyprus.

Features IV



Historical Comparisons: Compare the energy behaviour of your street in previous months or at the same month in previous years. Make this comparison more social by including the energy behaviour of your friends' streets.

Some Initial Facts



The application started officially at 1st August 2012.



More than **1,000 users** after 6 months, 1,400 likes on our Facebook page.



Eponymous supporters like the Cyprus Interior Minister Mrs Eleni Mavrou and the Commissioner for the Environment Mr Charalambos Theopemptou.



The most popular group of users (39%) is between **25-34 years old**. Younger people between 18-24 are also highly interested (32%).



65% of users live in an **urban environment**, 28% in the suburb, 17% in rural areas.



48% of users live in the **capital of Cyprus**, Nicosia.

Some Initial Facts



First prize award at the 2nd Green ICT Application Challenge, organized by the International Telecommunication Union (ITU).



Initial Evaluation

- Via questionnaires. 178 subjects.



44% found the app very **useful**. 36% found it just useful.



55% were affected positively to become more **energy-aware**.



16% believed their energy consumption was **high**. 78% perceived their “**energy profile**” through the app.



62% claimed their consumption was **reduced** in regard to last year.



57% are aware of their “**green**” and “**red**” friends.



48% used the app from **curiosity**. 71% for **environmental** reasons. 71% for **financial** reasons. 14% for responsibility as a **citizen**.



Most popular **incentive** for energy reduction is **discount on the bill**.



38% believe the app will be more useful in a few years.



64% believe the app will reduce their consumption **more than 10%**.

Current Work


Διήμενη αναφορά σχετικά με την κατανάλωση ενέργειας στην οδό που διαμένετε [View this email in your browser](#)

Ενεργειακή Συμπεριφορά στην Οδό σας

Αγαπητέ/ή Andreas Camel,

Μέσω του παρόντος newsletter, ξεκινούμε μια πρωτοβουλία ενημέρωσης σας μέσω email μια φορά την διμηνία, σχετικά με την τρέχουσα κατανάλωση ενέργειας στη οδό που διαμένετε. Στόχος μας είναι να σας θυμίζουμε κάθε τόσο για την ανάγκη ορθολογιστικής χρήσης ηλεκτρικής ενέργειας στη Κύπρο.

Συγχαρητήρια! Την διμηνία που πέρασε η κατανάλωση στην οδό που διαμένετε για την διμηνία Σεπτεβρίου-Οκτωβρίου 2012 έχει βελτιωθεί σε σχέση με την αντίστοιχη διμηνία Σεπτεβρίου-Οκτωβρίου πέρσι το 2011 ! Μπράβο σας! Συνεχίστε την καλή ενεργειακή συμπεριφορά για να μειώσετε την ηλεκτρική σας κατανάλωση, να εξοικονομήσετε χρήματα, αλλά και να βοηθήσετε στην προστασία του περιβάλλοντος!



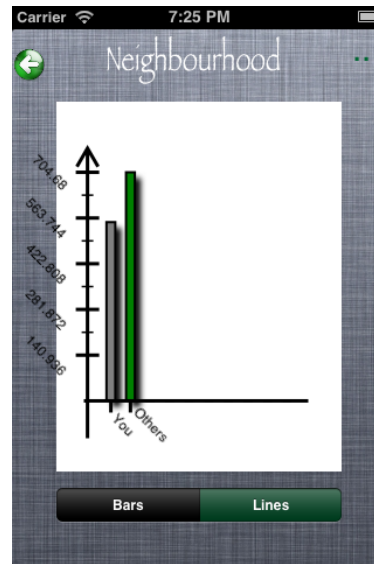
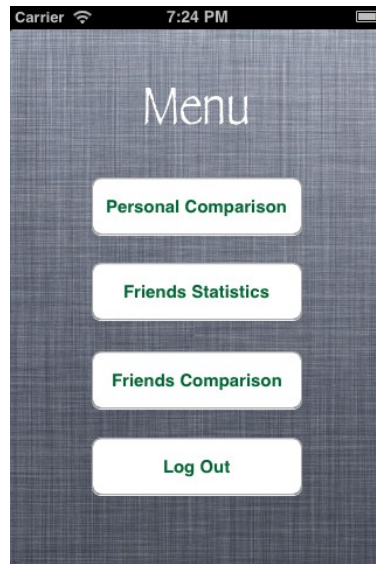
Σας προσκαλούμε και ενθαρρύνουμε να επισκεφτείτε την εφαρμογή μας στο Facebook, ώστε να ενημερωθείτε πιο λεπτομερώς για της ενεργειακή σας συμπεριφορά την τελευταία διμηνία Σεπτεβρίου-Οκτωβρίου 2012. Για να πάτε στην εφαρμογή, πατήστε [εδώ](#). Μπορείτε να κάνετε LIKE στην σελίδα μας, εάν δεν κάνατε ήδη, [σε αυτό το link](#).

A **newsletter** sent by email to the users of the application every two months, to inform them about their electricity footprint, comparing it with their local and social environment.



Current Work

Mobile applications for mobile Facebook users.



Current Work

🏠 About your house 🔒

ZIP code

Dwelling type

Own/rent

Home size sq ft

Number of adults

Number of children

A/C type

Heat type

Fireplace(s)

Pool

Spa

[Save my info](#)

More **effective electrical comparisons** between people that share common house preferences (e.g. home size, number of residents, heat type).



Next Steps

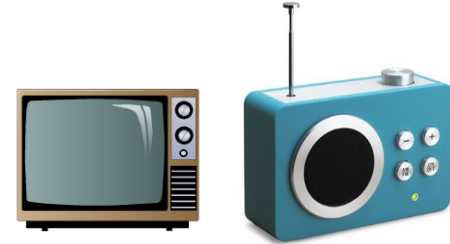
Access to Social Electricity by people who do not have Facebook **through a Web site** that offers location-based statistics and general information to Cypriot consumers of electricity.



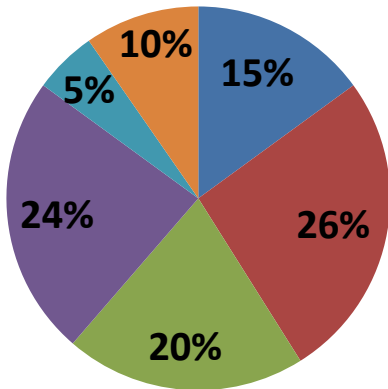
More **effective statistics** including a colour map of Cyprus according to the electric behaviour in different areas of the country. Discussion for building-specific statistics.

Next Steps

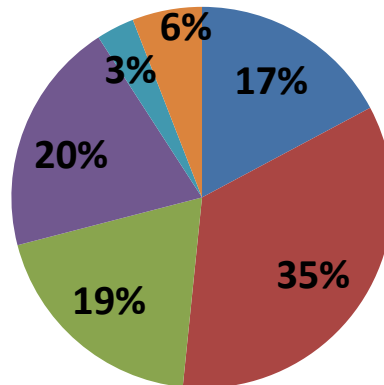
Privacy of electricity data



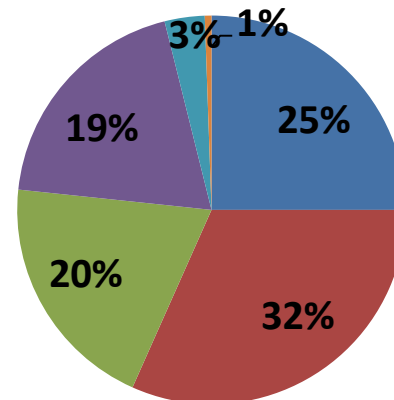
Neighborhood Data



House Data



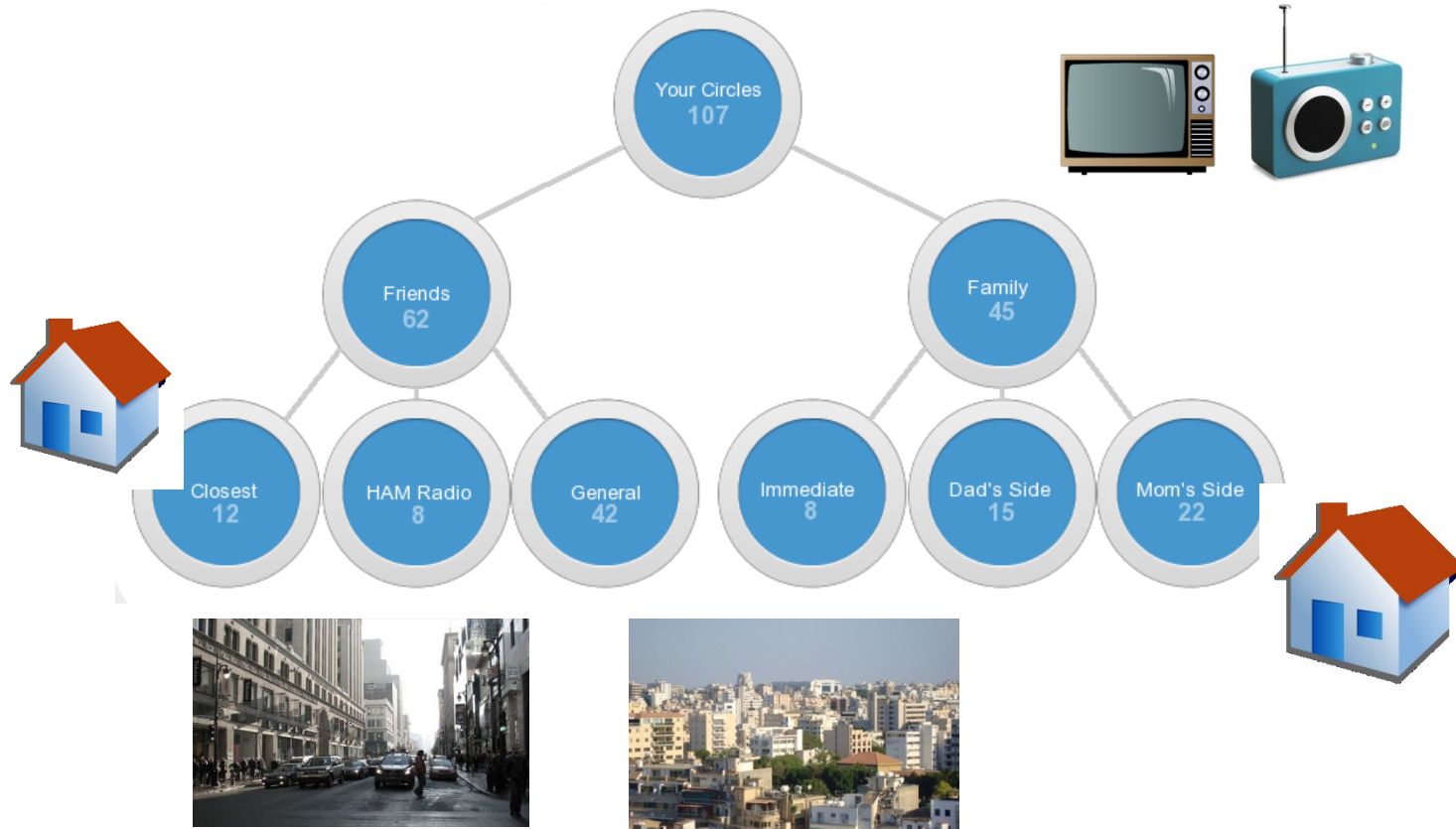
Electrical Appliances Data



- Me
- Family
- Members
- Relatives
- Close Friends

Next Steps

Circles of Privacy



Envisioning the Future



By 2020, the 80% of houses in Europe need to be equipped with smart meters.



Social Electricity can be extended into a **real-time platform** for electrical energy awareness and electricity-related comparisons.



Electrical energy **competitions** between friends, neighbourhoods and areas in real-time.



Awards to energy-efficient citizens and locations.



Financial motives to individuals, organizations and municipalities to save energy.



Envisioning the Future

Energy awareness through comparisons of electrical energy between neighbours, friends and citizens of other EU countries.



Thank you!



For comments/suggestions/feedback you can email me on kami@cs.ucy.ac.cy.