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Life

Deliverable due date: M36 - November 2019

D4.9 Carbon-neutral Me App in use in the residents and job-goers at all Zones (WP4, Task 4.5, Subtask 4.5.1)

Transition of EU cities
towards a new concept of
Smart Life and Economy

Project Acronym	mySMARTLife
Project Title	**Transition of EU cities towards a new concept of Smart Life and Economy**
Project Duration	1st December 2016 – 30th November 2021 (60 Months)
Deliverable	D4.9 Carbon-neutral Me App in use in the residents and job-goers at all Zones
Diss. Level	PU
Status	Working
	Verified by other WPs
	Final version
Due date	30/11/2019
Work Package	WP4 Demonstration in Helsinki
Lead beneficiary	FVH
Contributing beneficiary(ies)	-
Task description	Subtask 4.5.1: Urban platform data upgrades and two demonstrator App deployments. "Carbon Neutral Me", a mobile app will be implemented and distributed to the residents and job-goers of the project area to make the project interventions visible and to provide easy access to the project services (Energy Advisor, IoT data) and related services in the zones (e.g. e-car sharing, last-mile parcel delivery pop-up). The app informs about the energy production and demand to the residents based on real data (personal daily RES %, personal daily CO2 emissions, personal daily heating costs etc), and provides tools for easy behaviour change ("nudging" towards use of electromobility, budging towards lowering home heat). The app will be placed in open source and as based on harmonized APIs can be replicated elsewhere.

Date	Version	Author	Comment
15/10/2018	0.1	Timo Ruohomäki (FVH)	First draft
31/10/2018	0.2	Timo Ruohomäki (FVH)	Ready for review.

12/11/2019	1.9	Timo Ruohomäki (FVH)	First draft of the final deliverable M36

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Abbreviations and Acronyms

Acronym	Description
mySMARTLife	Transition of EU cities towards a new concept of Smart Life and Economy
API	Application Programming Interface, a set of functions and procedures that allow the creation of applications which access the features or data of an operating system, application or other service
MVP	Minimum Viable Product, an approach to scope the application development in a way that the first public release will only contain minimum features to provide the service

1. Executive Summary

Carbon Ego (formerly Carbon Neutral Me) is a mobile application and service intending to improve awareness of the user's carbon footprint. The action text introduces the expectation of the app providing tools for "easy behaviour change", which naturally is a demanding goal. The concept is based on modular and personalized design that can provide useful insights for the residents. The service utilizes widely available open data sources. New data sources are to be opened as part of the task and open development approach will allow other providers to improve their services with the new opportunities.

This document is the final deliverable for the project. At the moment the development of the service has started with careful evaluation of earlier pilots and services. In August 2018, a service design company Kuudes Helsinki started an extensive service design phase, including interviews, workshops and concept labs. Based on the information collected a design of the service will be completed. The materials provided at this stage will be specifications, wireframes and mockup layouts. After that the new data sources will be identified to meet the requirements of the service and a mobile app will be created and published.

The app will be provided as open source on GitHub repository[1] as well as the other developments part of the mySMARTLife Helsinki demo. All the other materials created during the process will be open too and published in the same repository. With this approach it is expected, that not only the app but it's core functionality can be re-used and embedded in other mobile services, such as route planners or city apps.

The usage of the app will continue throughout the monitoring phase and will be reported with suitable indicators. The experiences collected from the users during this period will be disseminated either as a form of publication.

At the time of writing this deliverable (12th November 2019), the application is not yet submitted to Apple App Store and Google Play Store. The app will be available within the next few weeks.

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[1] https://github.com/mysmartlife-helsinki/carbonego

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2. Introduction

2.1 Purpose and target group

This document provides an overview on activities and products related to deliverable 4.9 to general audience.

2.2 Contributions of partners

The following Table 1 depicts the main contributions from participant partners in the development of this deliverable.

Table 1: Contribution of partners

Participant short name	Contributions
HEL	Review and suggestions for updates
TEC	Peer review
CAR	Final review

2.3 Relation to other activities in the project

The following Table 2 depicts the main relationship of this deliverable to other activities (or deliverables) developed within the mySMARTLife project and that should be considered along with this document for further understanding of its contents.

Table 2: Relation to other activities in the project

Deliverable Number	Contributions
D4.10	This deliverable links to the data sources provided as part of the public transport navigator deliverable.
D4.14	This deliverable links to the data sources identified and developed as part of the monitoring system development.

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3. Service Design

3.1 Background

The City of Helsinki has recently set a goal of being carbon neutral by the year 2035. The definition of a city being carbon neutral is that all the emissions produced within the city limits are expected to be at the same level than the actions to reduce or offset said emissions. The Europe 2020 -strategy has set the member states a goal of reducing primary energy consumption by 20%, increasing production of renewable energy by 20% and lower the carbon emissions by 20%.

While the goals set on primary energy consumption or production of renewables can be somewhat achieved on a systemic level by guiding investments and tax incentives, the carbon neutrality is more complicated target since it will also require actions by common citizens. Incentives may generate reductions up to some point, but more detailed guidance in the form of behaviour change is also required. It is assumed that a mobile platform and the apps might provide interesting methods for this kind of service, including spatial awareness, mapping locations with actions and gamification.

When the mySMARTLife –project started, a Finnish company Natural Step attended on the first agile piloting calls at the Smart Kalasatama program, funded by the European Regional Development Fund ERDF. The agile piloting method has been used to support and accelerate urban development and engage a wider stakeholder network to co-create new services. In the process, a call for proposals is published with specific themes, leaving the tenderers the option to provide concept ideas they would like to further develop. The budget is rather small, typically 5.000-8.000€. Usually the concepts have utilized well existing data and services, making it possible to develop simple new concepts on MVP-level.

The project acquired more detailed memo of the experiences of Kotihiili –project. The information emphasized the need of quality data. Even the basic use cases like calculating the carbon footprint of restaurant were challenging since real time API's were not available. The proposed app was then based on manual logging of key activities. During the 26 days of trial period, 17 pilot users logged 3.337 actions, majority of them being related to meals. Due to the lack of resources the time and scope was limited, but already in 26 days some pilot users were able to show progress in their energy consumption.

3.2 The Concept Design Phase

The experiences were documented and included as reference material when opening a call for tenders in June 2018 for service design and user experience design services. The winning tender was selected based on references, experience of offered resources, communication skills and price. The weight of price as selection criteria was set low in order to attract experienced talents to attend.

The request for tender set the following deliverables for the concept design project:

1) Definition of user personas and user stories

2) Concept design of the app

3) User experience definition for the app

4) Data requirements specification for the app

5) Production input deliverables, such as draft layout design, wireframes, data-driven requirements and SDK requirements for the terminal. Functional demo or prototype was optional.

6) Plan to collect feedback and monitor user experience

Three tenders were provided as a response to the request for proposals. The proposals were evaluated with price, work plan, team and communication skills. The last part of the evaluation was made based on the proposal meeting. The winning proposal was provided by Kuudes Helsinki Oy.

3.3   The Informed Consumer

An app that aims to have an impact by behaviour changing of the target group has to be designed with deep understanding of consumer behaviour. The service design consultant Kuudes Helsinki has developed such insight since 2013 under the brand The Informed Consumer[2]. The database has been collected with consumer studies in both Sweden and Finland and is maintained constantly. The work aims to provide better understanding on the values and attitudes as well as the trends that shape the consumption choices of the consumers in these markets. As an additional benefit, studies made in two different country provide data on how these countries differ.

The studies combine a broad quantitative study, qualitative home-interviews with a wider societal context about emerging societal changes. The data is analysed together with academic professionals in both countries. It provides with findings that in combination with the insight specialists form a solid base on concept development, in-depth consumer projects and the development of future scenarios.

The latest trends support well the goals of the CarbonEgo concept. Currently, three trends are identified as relevant: significance, self-importance and moderation. Significance emphasizes that the consumption is the main way to follow and change norms. Living according to our values make us feel grounded and influential. Self-importance focuses on how we value the ambitious, omnipotent individuals. In general, Nordic people are extremely trend-sensitive. Moderation is the result of the North having undergone a rapid shift to an extremely individualistic culture. In such transition, consumption is a way to seek security. This will also result with long relationships with brands and products that make our lives easier.

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[2] http://theinformedconsumer.fi/

The following illustration shows the shift that has happened in consumer personas from 2014 to 2016. Some changes are significant, thus emphasizing the constant need to monitor the market in order to remain meaningful and have the capacity to change behaviour (n=1023).
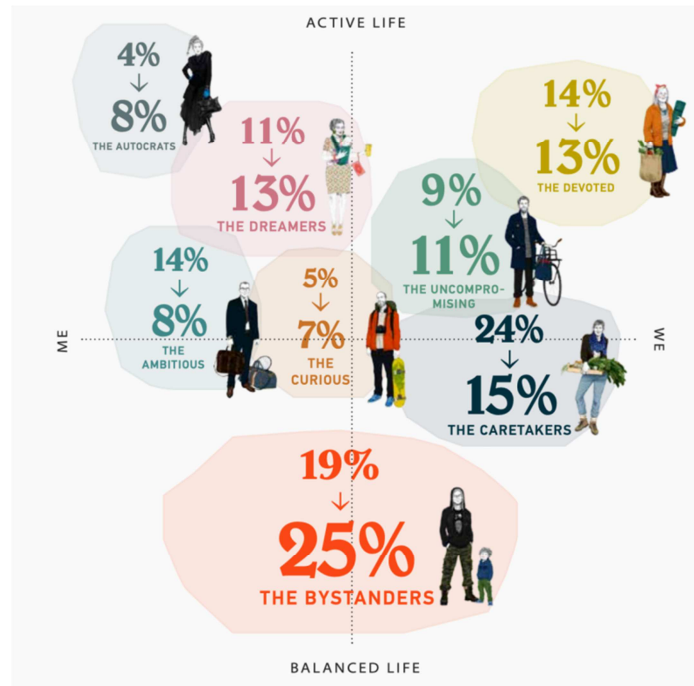

Figure 1: The Informed Consumer, © Kuudes Helsinki Oy

3.4 Co-creation

The draft service concept formulated from the consumer research and insight team was further developed in two workshops with citizens and related parties. The first workshop was held as a pre-event on MyData 2018 seminar in Helsinki, August 2018.

Figure 2: CarbonEgo Workshop at MyData 2018

The workshop focused on privacy, data rights and motivation. The service designers had defined four target groups based on their earlier customer research activities. The groups were named as Caretakers, Ambitious, Devoted and Bystanders. Together, these groups represent of 61% of the Finnish population.

For each of the groups a canvas was filled with the participants input on how they define the groups and their motivations. The following figure illustrates the input provided for the group Caretakers as an example of the method:

Target group	Value	Key insights	Data	Reason to believe
People who take care of this issue They have business interest Active, small/big They have the resources & attitude A bit conservative, careful Aware of data usage If THEY buy it, it can be scaled	Willingness to reach the common goals Being involved in something new & present new initiatives Benevolance: let's make the world a better place Building brand image Citizens can have better services **Obstacles/Risks** Slow process, results only seen in the end Lack of motivation if the goals are not clear Lack of resources Afraid of making mistakes How to combine date from different sources?	Visualize activity and achievements Co-operation / sharing experiences with other communities Share & show 1) public: feedback, 2) private: brand Equalizing the information for all citizens: they want to get all citizen groups onboard Need for standards & processes: someone gives a certification that "you can do this" They bring feedback to the loop Competitive advantage	Sources need to be trusted organisations! (Statistics Finland etc.) Covering and accurate enough Meet with legislation - - - - - - - - - - - More precise & detailed, real-time data How will we make it happen?	Authorities that bring credibility Authorities/forerunnes who are visible and spread the word There is loyalty by definition Values & brand are important If it's on the strategy they will do something

6.

Figure 3: CarbonEgo Workshop Canvas

The input collected from the co-creation workshop was used when defining the methods and approach for the second workshop called Concept Lab. The workshop was based on the methodology created by Kuudes Helsinki and had about 25 attendees.

4. Application Design

4.1   About application design

After the work on concept and motivational elements were completed, Kuudes Helsinki together with their technical subcontractor Lucky Few started to work on front and design and the screen flow of the application. One of the most relevant data sources was set to be the Climate Atlas, that provided the energy consumption information of every building in the Helsinki area. With this approach, the user was able to be provided relevant (and possibly) new information from her living without spending too much time on manually entering information that might not be easily available for the tenant. In the case of mobility there are few relevant data API's, but the combination of smart phone SDK and some additional sources provide the first steps on creating meaningful user experience also on mobility.

4.2   Scope

The data requirements were further refined with a specific focus on mobility and energy use cases and the open data available to support the cases. It was decided, that the product would be "MVP", minimum viable product that is developed with sufficient features to satisfy the early adopters. The final, complete set of features would then be designed and developed after considering the feedback from the product's initial users. It is also expected that the further development will rely on co-operation with other projects. This is also because it was clear that the availability of relevant data, especially personal data, would somewhat limit the initial release of the product.

The initial version of the product will not store any personal data on servers. The user profile is maintained on the phone only. In future releases this will change, since the local profiles cannot be used to create circles of friends that was identified as a potential mechanism to support behaviour change.

While the initial product will be launched as Finnish language version only, the development framework allows easy addition of other languages if the concept attracts other cities around Europe.

4.3   Onboarding

One of the experiences of other products was that a diary-like approach on registering daily activities would be hard to motivate and the users of such products would eventually stop adding their activities. Therefore, the onboarding phase should be as straightforward as possible. In the onboarding phase, CarbonEgo will provide two paths: either continue with generic information and minimal personalisation, or complete a survey that would form the basis of the carbon profile of the user.
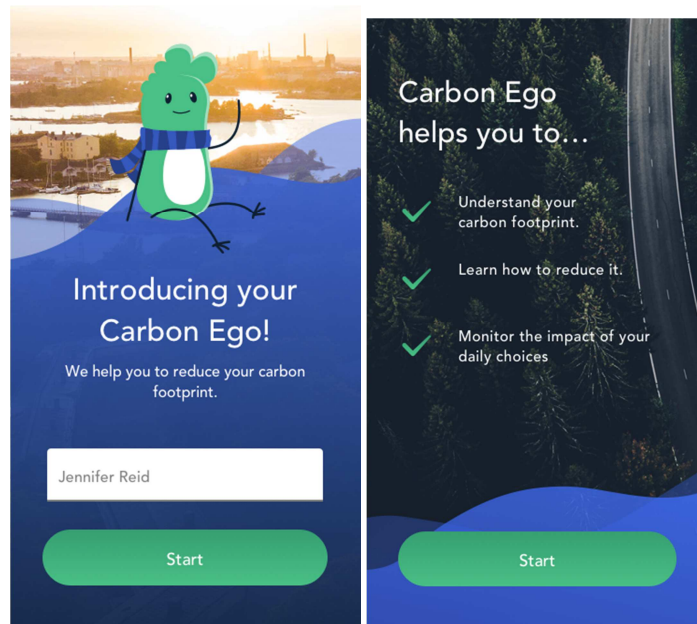
Figure 4: CarbonEgo Welcome Screen

The onboarding phase also includes an option to enter street address to locate energy consumption information of the home building from the Climate Atlas. This part of the onboarding is also an opportunity to emphasize the role of energy efficient living in the personal carbon footprint. Information such as the built year or energy class of the building might not be familiar to all the people, and so is not the energy consumption of the whole building. When that is allocated to the floor area of one's apartment, a realistic figure of energy consumption of living can be provided.

Figure 5: Details of Living

4.4   User Profile

The lifestyle survey is based on the Sitra's Lifestyle Test[3] with calculations from D-Mat Oy. The lifestyle test has been so far completed 871.330 times and the average carbon footprint of the users is 7200 kg CO_2e.

The lifestyle test has been embedded in the user onboarding routine:

Figure 6: Lifestyle Test Invitation

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[3] https://lifestyletest.sitra.fi/

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The test questions are relatively simple and easy to answer. In the current set, the carbon profile if created with a set of 25 questions.
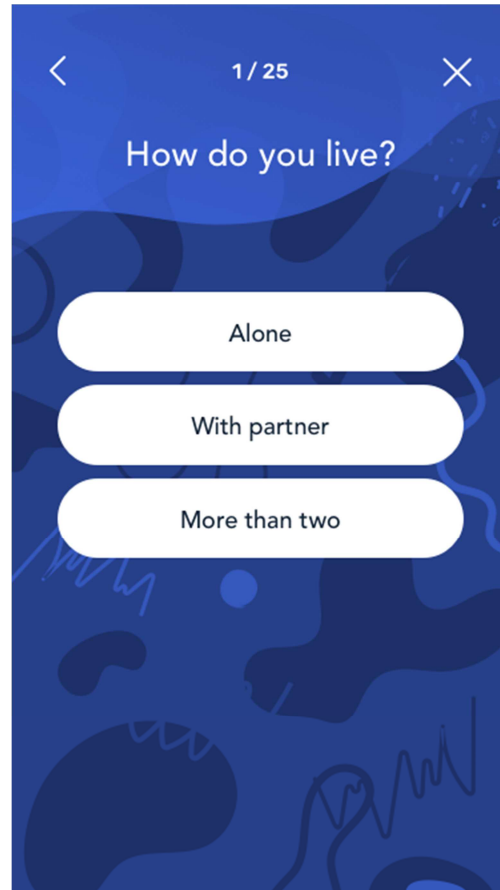

Figure 7: Lifestyle Test Sample Question

4.5   Challenges

The challenges are a mechanism to maintain the product interesting and up to date. Challenges also aim to provide an additional boost to the behaviour changing element of the concept. The following example screen illustrates the concept of a Challenge:
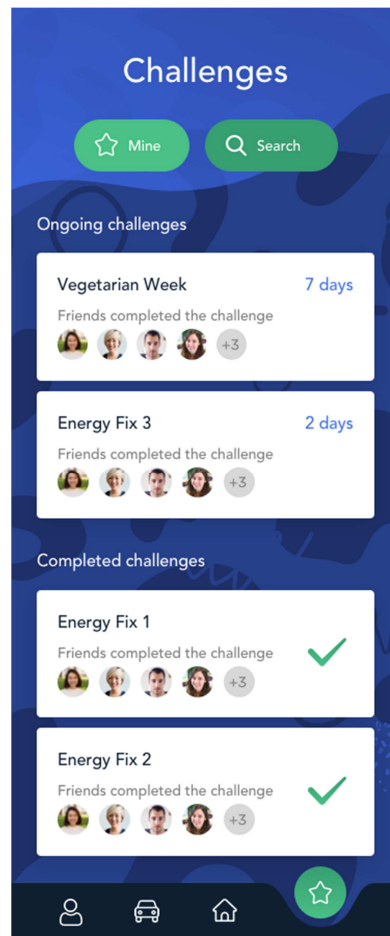
Figure 8: Challenges

4.6   Launch Plan

Originally it was considered that the CarbonEgo would be launched only as an Apple iOS app. Due to the used programming technology (React Native), it is however simple to create also a Google Android - version. Therefore, the app will be made available on both Apple Store and Google Play Store. Much of the data-driven functionality is only available on the Helsinki region, so the app availability will be restricted by location.

4.7   Support and Communications

The project will have only limited resources for end-user support but this is expected to last at least to the end of the project in 2021. By that time, it is expected that a partner or another project is found to continue maintaining the service. The launch will be supported with helpdesk operation that is monitoring e-mail and twitter communications. New challenges will be created and the product is under active development at least for the first months after launch. The adoption and feedback will be reported during the monitoring phase of at least 12 months period.

5. Conclusions

The key finding of this deliverable has been the nature of app development work. With modern tools such task is not anymore technically challenging or time-consuming; however meeting the expectations of the potential users requires extensive surveys, prototyping and collection of background information.

The Carbon Ego App was developed with detailed scope in order to best utilise the data made available by the project. The most meaningful dataset originated from the project was the building energy dataset also used in Climate Atlas that is the basis of personal carbon footprint calculation. For other areas of daily life locating useful and up to date data was proven more challenging. Since the application and its concept is developed in open fashion and source code is made available, it is expected that the app can be extended when more data-driven use cases.