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Statement of Originality

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About this Document

This deliverable describes the development process and initial release version of the AURORA app, which will be used by citizens to track their energy behaviour. It is already available on TestFlight (Apple) and will be released to the Appstore after key discussions about some features have been concluded within the consortium (Section 1). The app has been developed using a co-creation approach by involving citizens within each AURORA demo-site from the start (Section 2). Based on the app co-creation report, formulated on those inputs and findings, an app development roadmap was produced to prioritise features of the app based on requirements by the Grant Agreement, discussions within the project consortium, and needs of future app users (Section 3).

1 The AURORA App

1.1 Status-quo

As of today (28th February 2023), a mobile application for the AURORA project with most of its core functionality is technically operational and ready to be released. The implemented functions include: a carbon footprint calculator for heating, electricity, and mobility; registration functions to support community-building and communication within, across, and even beyond the demo-sites. The consumption data can be exported and shared publicly by each user individually, and the app also allows aggregated data to be exported in highly anonymised form (in full compliance with GDPR). The app is designed from the ground up to keep users engaged, by providing a visual break-down of tracked emissions, updating in real time, allowing users to schedule reminders for upcoming consumption entries (e.g., monthly electricity bills), and serving as a personal “consumption diary” by allowing users to leave personal notes (optional) with each entry for their own convenience and future reference.

The app has been available via TestFlight (a beta-testing platform for Apple devices) for a few weeks and went through a standardised usability test within the AURORA consortium (see below for a report on test results).

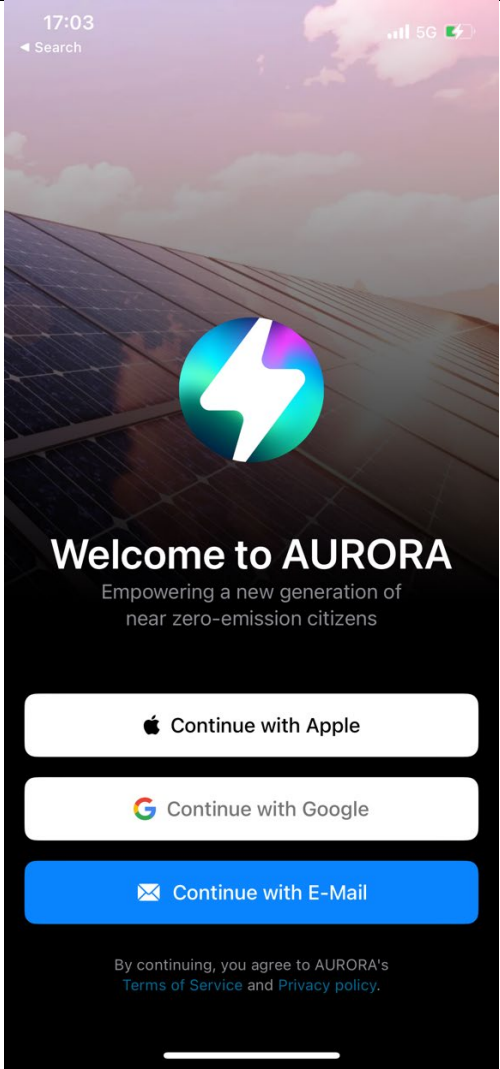
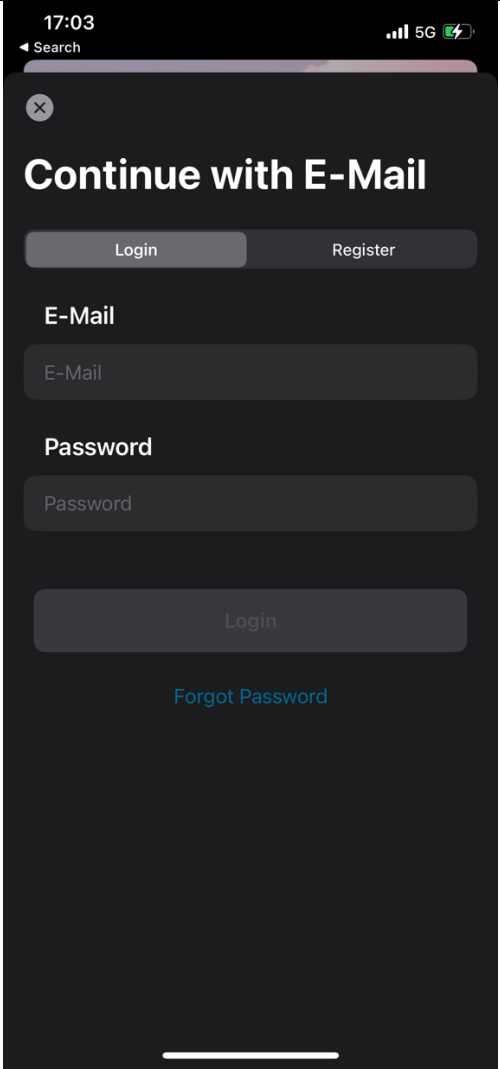
Before launching the app publicly (beyond the consortium), the project is planning to make a few final key decisions in the next ca. two weeks, such as specifications of the labelling scheme (a discussion being completed in WP1), and data privacy aspects as part of the legal disclaimers (to be finalised / verified in accordance with WP7 (Ethics) and the UPM Data Protection Officer). We are also planning to include an existing JRC carbon footprint calculator tool¹ to allow app users to estimate how certain investments in the crowdfunding scheme would affect their footprint. The finalised version of the app will also be ported onto other platforms such as Android.

Both individual and aggregated data about the citizens' crowd-funding investments and the technical performance of the photovoltaic installations in each demo-site, will be displayed once that data is available.

¹ https://re.jrc.ec.europa.eu/pvg_tools/en/#api_5.1



1.2 Screenshots and Features

Registration & Login	
 The screenshot shows the AURORA app's welcome screen. At the top, the status bar shows the time 17:03, a search icon, and 5G signal. The background is a sunset over solar panels. A large, colorful lightning bolt logo is centered. Below the logo, the text reads 'Welcome to AURORA' and 'Empowering a new generation of near zero-emission citizens'. At the bottom, there are three buttons: 'Continue with Apple', 'Continue with Google', and 'Continue with E-Mail'. A small text at the very bottom states 'By continuing, you agree to AURORA's Terms of Service and Privacy policy.'	 The screenshot shows the 'Continue with E-Mail' screen. At the top, the status bar shows the time 17:03, a search icon, and 5G signal. The background is dark. The title 'Continue with E-Mail' is at the top. Below it are two buttons: 'Login' and 'Register'. Then, there are two input fields labeled 'E-Mail' and 'Password'. Below these is a 'Login' button and a 'Forgot Password' link. A close button (X) is in the top left corner.
First screen the user sees when opening the app after downloading. They can choose to create an account via sign in with Google, Apple, or any Email.	If the user already has an account registered via email, they can sign in here. This screen shows after tapping “Continue with E-Mail”.



Profile & Settings	
<p>After registering an account, users are prompted to complete their profile with some personal information. This is helpful for the project to run fully anonymised usage statistics, such as those required for D2.4 and D2.6, as well as getting an accurate picture of engaged citizen demographics.</p>	<p>The settings screen of the app allows editing profile information after registration, as well as adding entry reminders, downloading data, or deleting the account, as is required by GDPR regulations.</p>



Consumption Dashboard & Adding Entries	
<p>On the consumption dashboard users can see how much CO₂ they have already produced according to their tracking, add / delete consumptions, and view a full history of all their entries. The visual representation of the overall CO₂ stats is currently being reimaged in collaboration with the labelling scheme to align both components closely.</p>	<p>When adding a consumption, users need to enter a few details about it based on whether it is a heating, electricity, or transportation type consumption. Using these parameters, the app then calculates the appropriate carbon footprint amount in kg of CO₂.</p>

1.3 Future Development and Updates

As described in Annex 1A of the Grant Agreement (p. 16), this deliverable will continuously be updated throughout the entire lifetime of the project (and possibly beyond) as functionality in the app will be modified due to user feedback or general software development requirements such as data management and safety.



1.4 Usability Test #1

The internal usability test conducted in February 2023 by means of a standardised online protocol has produced the following results:

Over two thirds of those consortium partners testing the app used an Apple iOS device to test the app interactively, the others followed a narrated screen-capture video. No technical issues in downloading the app from TestFlight were reported by any of the testers. All three registration options (email, Google, Apple) were tested by consortium partners.

Regarding registration, all respondents expressed the highest level of agreement in that the process is "easy to understand", "intuitive how to use" and "visually well designed". One user tried to register via laptop and did not manage to login with any of the three methods. This is possible due to iOS apps being able to run on specific Mac laptops and support for this is being implemented.

All respondents strongly or somewhat agreed that the functions for adjusting settings of the app are "easy to understand", "intuitive how to use" and "visually well designed". One respondent decided to remain "neutral" about the settings functionality. They suggested other data export formats than JSON files for downloading user data. While the file format is standard for data science, fully open, and in line with giving users full control of their data, other export options are being considered for future updates.

The function of adding consumptions has also tested very positively, with all respondents strongly or somewhat agreeing that this function is "easy to understand", "intuitive to use", and "visually well designed". One respondent decided to remain "neutral" about the design in this case and suggesting adding sources of electric energy. Currently the app's features for energy tracking are fully in-line with the carbon footprint calculator developed in WP1. Extending tracking options will be considered for future updates. Another user suggested adding Danish crowns as an alternative currency, which probably also applied to British pound. In this regard, the project will also still need to decide whether energy costs should remain a compulsory entry or rather become an optional input. While such changes to the app are technically trivial, they require a collaborative decision from the relevant project actors, hence this functionality is being released with the next update. Lastly, one user suggested to add an "edit" functionality to existing consumptions, which is already on the roadmap and will be implemented in a future update.

No further changes have been suggested by any of the testing users as part of the 'free testing' exercise.

Once released publicly, AURORA is also going to conduct a standardised usability test among citizen scientists willing to register. With every significant change to the functionality of the app in the next two years, further usability tests will be conducted within the consortium and/or among all users.



1.5 Outlook to D2.4 and D2.6

As foreseen in the Description of Action for AURORA, the next deliverable in WP2 (D2.4) is going to report on the use of AURORA app for environmental monitoring of energy impacts. We are also expecting this deliverable to be submitted according to schedule (i.e., as a preliminary analysis by M18, and finally by M36 as D2.6).

2 App Development as a Co-Creation Process

The success of the AURORA project will primarily be measured by how many citizens participate and ultimately make the desired changes in behaviour and even financial investments. Considering that these behaviour changes are mainly expected to be facilitated by means of a mobile application, the success of the project at large depends fundamentally on the app's effectiveness and thus usage, for which a high acceptability is the first and foremost prerequisite. AURORA has therefore implemented a co-creative design process for the Environmental Impact Monitoring (WP2), and the mobile app in particular. Principles of collective experimentation, user-driven innovation and RRI have been applied in Year 1 of the project, as described in the separate concept for the "Innovation Café" events held in each of the demo-sites during spring / summer 2022. The initial concepts and this Co-creation Report are also based on an initial online survey conducted within the consortium, to identify main priorities regarding the technical requirements. The final co-creation report was shared on 9th September 2022 (as version 1.5) within the consortium internally. Its main parts have also been included in D2.1.

To ensure a data collection that is both specific to the local conditions and to the requirements in each demo-site, as well as comparable across the pilots, we designed a highly standardised survey for both the Café events, and the follow-up data collection. With sufficient data collected, these results could even be generalisable to European citizens at large and thus maximise the representativeness of the analysis.

Our assessment of the needs, expectations, and caveats expressed by future users of the mobile app as to its functions and usage addressed mainly the following four questions:

1. Which functions and features do the potential users generally expect and need with regard to the app?
2. What are their caveats and concerns?
3. How do they respond to specific usage scenarios and interface designs?
4. How do these expressions correspond to the project's objectives, data collection needs, and ideas for e-collaboration, etc.?

For analytical reasons, particularly considering the fact that not all participants at the events can be expected to eventually also use of the mobile app, the survey furthermore needed to filter as to which extent each participant has already decided to join the project. Thereby respondents under a certain threshold of interest could be disregarded, so that the main analyses focus on those respondents who at least considered it likely that they might also use the app at some point.



Data was collected between 25th April 2022 and 9th September 2022, leading to 262 responses in total. While the overall number of responses is meanwhile almost satisfactory (68% of the expected minimum sample size), the data unfortunately varies extremely between the sub-sample sizes (e.g., more than three times as many data points from AU compared to UPM). With the exception of AU, none of the subsamples allow us to draw any statistically valid conclusions, which is being addressed in the further data collection unless of course the project intends to give up its goal to analyse locally specific patterns. Data collection is ongoing to allow for updating and thus potentially increasing accuracy and precision of the measurements.

2.1 Summary of Survey Results

For the time being, the response rates to the latest online survey do not yet allow us to draw statistically valid conclusions for specific demo-sites, especially when disregarding those responses that indicate that a participation in the project and thus a use of the mobile app are somewhat unlikely. This high degree of uncertainty (24%) may also indicate that many participants' hesitation (if not even outright scepticism) is due to a lack of trust in the project, which would also mean that it is too early to draw conclusions from the available user expectation data, and that further information and trust-building activities for the potential users are a prerequisite to even analyse usage prospects that would allow the project to make evidence-based decisions about technical specifications of the mobile app.

Even if demo-site specific analyses were to be disregarded entirely due to insufficient sample sizes, a more general analysis of the available user feedback across all five demo-sites does not support several key assumptions made by the project consortium about app features and their prospective use.

Survey results across all of the main data inputs (electricity, heating, and mobility) clearly indicate that the potential users are significantly less willing to provide and receive information about their carbon footprint than expected by AURORA, let alone in the time intervals as foreseen by the project proposal.

When interpreting these numbers, we need to consider that the significant degrees of uncertainty if not even lack of support has been expressed by survey participants who were explicitly sampled as citizens who are generally interested in the project and additionally willing to contribute and / or invest. It goes without saying that acceptance rates and willingness to provide data will be significantly lower among people to be contacted as potential participants compared to those already involved.

Based on the available data (as of today), none of the planned key functions of the app would be used by a sufficient proportion of project participants, nor could the users be expected to provide data as regularly as necessary for the foreseen monitoring and the automated recommendations.

As shown in the analysis of the sub-samples above, data from Portugal is significantly skewed regarding average age (47 years), while data from Slovenia is extremely skewed toward male participants (74%). Statistically, in both cases but particularly the latter, the distortions cause severe data accuracy issues also for the project-wide analysis, not just for the sub-samples.



It will need to be investigated why respondents to the local survey in the UK pilot unanimously objected to providing any data on electricity or upload figures directly from their heating bill. Such a clear result almost suggests that the survey question was misunderstood (which pre-testing does however not indicate at all).

The data analysis furthermore shows large differences between the energy systems of the five pilots. If heating, for instance, is provided as part of the electricity consumption in one region, which is not the case at all in another, the project will need to be particularly careful when trying to compare figures on consumption and reduction of heating costs and/or electricity.

The general scepticism and unwillingness of users across all pilots to provide mobility data, will need to be considered for the design of the app.

Only one out of five respondents see a value in receiving app notifications more often than once a week, which is also significantly less often than what the project had anticipated. Regular activation or even nudging techniques generally require more frequent interventions, so that the project may need to reconsider this approach.

As a result, any further technical specification of data inputs, let alone their technical implementation, may need to be put on hold until the project has decided about mitigation measures, thresholds, and next steps in general.

Furthermore, until the sample sizes for each of the demo-sites are satisfactory, no site-specific conclusions can be drawn from the existing data, which bears the significant risk of misinterpreting user expectations because the identified caveats may actually only be prevalent in one or two demo-sites but not in others, which is very likely as we can already see now from the significant differences between the five samples. The sample for UPM, which is by far the smallest anyhow, is additionally missing data, which limits an analysis of mobility monitoring further.



3 Roadmap for the Software Development

An App Development Roadmap was initially finalised in September 2022 (as version 1.3) and circulated within the consortium. The roadmap included here in this deliverable has been updated to include the development status of each feature.

Based on **discussions** and an initial **online survey** within the consortium to identify main priorities about technical requirements (documented as *App Development Strategy*, version 1.3 from February 2022), followed by **co-creation activities** with future users of the mobile app (documented as “AURORA App Co-creation Report”, version 1.4 from September 2022, Section 2), this document describes the planned features of the app, and the respective priority of each feature for the functionality of the application.

Based on **requirements engineering** and the first **user experience design** with mock-ups, the following **functional specification** defines a number of steps that cannot be reverted unless the project intends to face a significant increase in development costs.

As foreseen in the AURORA work plan, a functional **prototype** was programmed and completed by the end of 2022, starting with functions that are categorised as “CORE” below. Potential additional features will then be implemented according to their priority, later in the project.

Priority Level	Description
CORE	All features marked as “CORE” are planned to be completed by the end of 2022 to comprise a first functional prototype
LEVEL 1	Features that are required for launching the app publicly and testing its key functions (e.g., in all project languages). To be implemented as soon as possible once all CORE features are done.
<i>Once all features labelled as CORE and LEVEL 1 will have been implemented, the mobile app is ready for being launched publicly. In addition to software development, this step will also require a translation of all programme dialogues and documentation into at least the other four project languages (ES, DK, PT, SI). Successful usability tests in all five demo-sites are also considered a prerequisite for a wider public launch.</i>	
LEVEL 2	Features that could be implemented after the initial launch. These features are considered necessary to fulfil the requirements of the AURORA work plan.
LEVEL 3	Optional features that are technically not required but could potentially be considered if certain reasons justify the additional effort in the remaining project time with remaining WP2 resources.
LEVEL 4	Features that would be ‘nice to have’ but are neither required according to the work plan nor likely to be implemented.



By including the *App Development Roadmap* into this deliverable (D2.2), and the software development being fully underway with completion of all CORE level features, a column for “Status” has been added below. This indicates the development status of specific app features.

Status Level	Description
Done	Features that have been fully implemented and are considered complete for the time being.
WIP (“Work in Progress”)	Features that are still being adjusted / calibrated / specified. They are mostly complete and/or currently being tested internally before being released. Unless the project will encounter unforeseen and significant obstacles, we are expecting all “WIP” functions to be released next month (March 2023).
Pending	The feature has been added to the backlog but is not yet implemented or actively being worked on while other more important features are being developed.

Topic Area	Features	Priority	Status
Software	iOS Compatibility The app should be compatible with all iOS devices running iOS 13.0 or higher (see the data analysis from our co-creation activities: ca. 25% of participants use devices with this operating system).	CORE	Done
	Open Source The app should be developed as an open-source project, thus adhering to Open Science standards in Horizon 2020.	CORE	Done
	GDPR compliance The app has to be fully GDPR compliant by requesting user consent upon registration, and encrypting all data sent to and from the app. Users can download or delete their own data at any time through their profile settings in the app.	CORE	Done
	Architecture The app runs natively on iOS devices	CORE	Done
	Android Compatibility The app should be compatible with all Android	LEVEL 1	WIP



	devices running Android 8.0 or higher		
	Localisation The app has to be fully localised for the project languages, where English is assumed as the default. Additional languages such as French and Mandarin will be discussed at a later point.	LEVEL 1	WIP
	Compatibility with other devices The app should be compatible with tablet devices, and potentially laptops, which allow running mobile applications, such as Apple Silicon MacBooks or Windows 11 (if available).	LEVEL 4	Mac: WIP Windows: Pending
Registration & Login	User registration & login	CORE	Done
	Alternative social login options <ul style="list-style-type: none"> - Sign in with Google/Apple/Facebook/Twitter/LinkedIn 	LEVEL 3	Google & Apple: Done

Registration - User Data	Demo site selection Upon account registration, users are required to select from the following options, which will determine the demo-site their account will be attributed to.	CORE	Done
	Including other locations Citizens interested in using the app without being affiliated with any of the five demo-sites, should be included at some point of the process by adding “Other locations” as a response option.	LEVEL 2	Europe (general): Done
User account settings	User account settings – Basic Settings menu where users can administer their own account with the following settings: <ul style="list-style-type: none"> - Edit login details (email, password) - Notification settings (see “Notifications” feature below for further details) - Download all user data - Delete all user data 	CORE	Done
	User account settings – Profile / Household Settings menu where users can configure their carbon profile:	LEVEL 1	WIP



	<ul style="list-style-type: none"> - Number of people living in household (adults/children) - Year of birth of each individual (to ensure age is automatically updated) - Key data from the accommodation's Energy Performance Certificate (EPC) - If users do not have EPC data at hand, they may need to be able to enter key parameters manually, such as: <ul style="list-style-type: none"> > Type of accommodation (flat, house, bungalow) > Size of accommodation (square metres) > Type of heating source: Heating oil, Natural gas, Liquified Petro gas (LPG), Biomass, Locally-produced biomass, Geothermal, Solar thermal, District heating, Coal, Natural gas, Oil, Electricity, Solar thermal energy, Geothermal energy, Biomass, Waste treatment, Default, Electric heating <p><i>Note: Considering that manual entries would lead to highly inaccurate data due to missing details such as the exact type of heating (e.g., modern or old oil heating) and the general mix of different energy sources for different purposes; height of the ceiling and wall / window insulation; year and extent of the latest energy-relevant renovations have taken place, etc.</i></p> <p><i>The project consortium may therefore also consider not to offer such data entry options to protect the accuracy of the data from certified EPC sources</i></p>		
	<p>Personal vehicles</p> <p>Users can add the vehicles they use personally by entering specific data about those, such as brand, manufacturing year, motor type, or in the case of an e-bike how it is usually being charged, etc. This information can be used in the "Mobility" feature, to improve the accuracy of the carbon footprint calculations.</p> <p><i>Note: Calculating carbon footprints based on vehicle-specific characteristics may require editorial / manual categorisation unless vehicle databases were automatically integrated (which is unlikely for reasons of programming effort and the updating of vehicle data).</i></p>	LEVEL 3	Pending
	<p>Multiple households per user</p>	LEVEL 4	Pending



	Allow users to add multiple households in case they have a second/third home. Data entry will be identical to the first, and users will have a new dropdown throughout the app to select which household they are attributing their entered data to.		
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Notifications	Data entry reminders Users can receive notifications on their device about entering their latest data regarding energy, mobility, and heating. Notification frequency can be customised, including setting a specific date on which users want to be reminded, e.g., when their next electricity bill comes through. Otherwise, the app estimates based on the last data entry period (e.g., monthly / annually) when users will have likely received their next electricity/heating bill.	CORE	Done
	Other notifications Notifications should also be triggered when a user reaches a new level (see “Gamification”), tracked their mobility through GPS (see “Mobility”), or when new recommendations are available (see “Recommendations & News”)	LEVEL 1	Pending
	Email notifications Users can opt-in to receive email notifications, which offer similar customisation options as regular notifications, but are generally less frequent (e.g., only available for data entry reminders, or a digest of new recommendations/news)	LEVEL 2	Pending
	Messenger Notifications Users may also choose to receive notifications through a messenger service, such as WhatsApp, Telegram, Signal, or Facebook Messenger. These act the same as email notifications.	LEVEL3	Pending

Energy Profile	Energy Profile Overview Summary of all currently implemented recordings for users’ energy behaviour, such as carbon footprint, electricity and heating energy used, impact of mobility to carbon footprint, and investments into local demo	CORE	Done Improved Overview:
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	<p>site technology.</p> <p><i>Note: This overview is mandatory but will have to evolve based on the data that is actually being captured. For the early development stage, this can simply show an aggregate of the gathered data.</i></p>		WIP
	<p>Labelling system</p> <p>Based on a user's overall performance towards reducing their carbon footprint, they will be assigned "labels". These labels will be defined by the wider AURORA consortium and will act as a type of 'badge achievement' for reaching certain milestones on a user's journey of becoming a "near zero emission citizen".</p> <p><i>Note: Details on the thresholds and algorithms to determine the different levels of these labels are being finalised at the moment and will be implemented in spring 2023.</i></p>	LEVEL 1	WIP
	<p>Comparing energy profiles</p> <p>Users can compare their energy profile to other users within their demo-site community and within the project at large. They can see the overall performance of their community, as well as their own rank (e.g., higher, or lower consumption per square metre of accommodation, or carbon emissions per kilometre travelled, energy saved within the past 6 months, etc.)</p>	LEVEL 2	WIP
	<p>Social sharing of energy profile</p> <p>A user's energy profile should be easily shareable on social media, such as Facebook, Twitter, Instagram, or LinkedIn.</p>	LEVEL 2	Pending
	<p>Customise social sharing of energy profile</p> <p>Users can select which parts of their energy profile they want to share (e.g., only mobility, or everything except their investments)</p>	LEVEL 3	Pending
Gamification	<p>Experience & Levelling</p> <p>Submitting data to the app will award users with points, while enough points will let them "level up". This is purely for motivational purposes.</p> <p>All actions in the app award points, such as completing their user/household profile, or submitting</p>	LEVEL 1	Pending



	energy and mobility data.		
	Levelling rewards Levelling up provides users with rewards, such as profile images, backgrounds or colours that are displayed when content is shared to social media.	LEVEL 4	Pending

Integrations	Integration of more automated solutions / AI The app performs certain automated actions. Based on specific conditions, for example if a user is over a certain threshold for their carbon footprint, certain messages or actions could be triggered. This Plan suggests “IFTTT” integration, but other comparable services may be equally sufficient, such as the “Shortcuts” app on iOS devices.	LEVEL 2	Pending
	PV Investments Users can add their investments to their local demo site’s PV installations. This requires an integration with the log of investments actually received by the demo sites. To avoid manual attribution of each micropayment across the project’s lifetime, the sites could issue a unique code (e.g., a QR code) for each investment made, which they could then be scanned or entered in the app to “claim” their contribution. <i>Note: This will greatly depend on how demo sites are managing investments, which has not been fully defined yet.</i>	LEVEL 2	Pending

Photo-voltaic installations data	Documented API for Photovoltaic systems The app, or the corresponding server, will provide an API for the demo-sites to push their latest information about the local photovoltaic (PV) system into a database. This API will accept some sort of data package with specific information about the current state of the PV system. Project partners at the demo sites will feed their information regularly through this API, as defined by project partner QPV.	LEVEL 1	Pending
	Displaying PV data The data sent via the API by the demo-sites should be displayed to the users. Users would see their own	LEVEL 2	Pending



	demo site data by default but may select to view other demo sites too.		
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Electricity & Heating Data	Electricity Data Users can enter their electricity consumption in kWh for a specific timeframe, including historic data from their previous electricity bills. This should also include the costs associated with the timeframe. Users can choose the specific period themselves through a date picker (start/end date). Filling in future data will smartly pre-set the start date based on the last entered period.	LEVEL 1	Done
	Heating Data Users can enter their heating energy consumption in kWh for a specific timeframe, including historic data from their previous heating bill (e.g., last year). This should also include the costs associated with the timeframe. Users can choose the specific period themselves through a date picker (start/end date). Filling in future data will smartly set the start date based on the last entered period.	LEVEL 1	Done

Mobility Data	Mobility Data – Manual Entry Users can enter their mobility data.	LEVEL 1	Done
	Automatic tracking Users can allow the app to use GPS and track their movements. If a user has moved a certain distance at a certain pace, the app will guess, ideally also based on previous mobility data entered by the user, which mode of transport they were using, and how far they have travelled. At the end of the day, users will receive a notification to verify or adjust the recorded mobility data.	LEVEL 3	Pending
	Google Maps Integration As Google maps keeps a record of when users travelled where, how far and by which means, users can allow access to their Google Motion Profile for automatic synchronisation with the AURORA app. Likewise on Apple devices. <i>Note: It is yet unclear to which extent the app would</i>	LEVEL 4	Pending



	<i>have access to this data. Participants have furthermore expressed that they would mostly object to having their mobility automatically tracked this way.</i>		
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Other features	Recommendations & News In a designated “Tips” section, users can review recommendations for lowering their carbon footprint, which are published by the AURORA consortium. They can choose to add specific recommendations to a “bookmark” list, so they have easier access to them, as well as “complete” a recommendation, if they have tried or successfully done it.	LEVEL 2	Pending
	Shareable Recommendations & News Entries as described in the line above, can also be shared on social media.	LEVEL 3	Pending
	Online dashboard Certain aggregated data from the app users should be visible in an online dashboard, which is openly accessible to any visitor (no login required). This should at least include data about the PV systems, as well as aggregates of the user data for each demo site. Ideally, the online dashboard can also serve as data input for the digital signage systems in each demo-site. <i>Note: Should this dashboard not be feasible, we can build our own dashboard, provided the required data is served through an API.</i>	LEVEL 3	Pending
	Basic Surveys Administrators should be able to create basic surveys through the admin dashboard. Users would then be notified about a newly released survey. These are intended to be very short and will ask about user experiences with the app, whether the app has changed their behaviour/perception regarding their own carbon footprint, and other information required to get a better understanding of the type of people using the app. -	LEVEL 4	Pending



Admin Dashboard	Customisation of variables <p>Throughout the app, many different variables will be used, such as the carbon footprint of specific vehicles (e.g., plane, train, bus, etc.), average energy consumption per household, and more. These variables are used to calculate the carbon footprint based on the data entered by users and will need to be updated regularly. Each variable will also be specific to each demo-site region.</p> <p>The members of the wider consortium can update this data but require an interface to do so. Updating a variable must not impact any previously entered data!</p>	LEVEL 1	Done
	Data monitoring <p>For specialised super users, monitoring the data coming into the app is required. This should include a breakdown of all data, separated by category. Super users should have the ability to delete data if necessary. This might be required in case faulty data was published through the API.</p>	LEVEL 1	Done
	Support Channel <p>The app should provide a support channel, where users can submit a bug or other problems they have while using the app. Users can complete a simple form, describing their issue, with a dropdown to select the type of issue.</p> <p><i>Note: Any suggestions for an external tool that works best for collecting these reports is welcome.</i></p>	LEVEL 1	WIP
	Recommendation & News management <p>Admin users can edit/add/delete entries in the “Tips” section of the app. These can also be added as draft (hidden to users), scheduled to appear on specific dates, made exclusive to certain demo site regions, and translated.</p>	LEVEL 2	Pending
	Survey administration and review <p>Administrators can create surveys targeted to specific regions, and review the results via charts, or simply with a data export option.</p>	LEVEL 4	Pending

