



D6.1: Evaluation framework

Internal document

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Reviewers:
Digi-Label consortium

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Summary – what needs to be contributed?

Whenever you come across...

...please forward documents or references to market statistics about appliances for the relevant countries (ES, UK, IT, DE, CZ) to Fraunhofer ISI (simon.hirzel@isi.fraunhofer.de).

During negotiations with retailers about participation

- Discuss that we want to survey customers and employees about their experiences with the digi label tool
 - Discuss the procedure: Where in the shop can this take place? What is a suitable time (weekday, hours)? How can employees be approached? For online retailers / retailers with additional online shop: Is it possible to place a link on their website to the survey?
- Ask if there is a possibility to get data on sales
 - The most preferred option is to get the sales figures from the full pilot / roll out period for all appliances on a model / type basis that were labelled with Pocket Watt plus the same data from a period of the same length prior to introducing Pocket Watt. Ideally the provided template is used; custom formats may work as well - in this case, contact Fraunhofer ISI beforehand
 - Alternatively, retailers could report the shifts in energy efficiency of appliances bought as they read it from their data if available.
 - If no data is shared, then we need at least estimations from the retailer about shifts in sales.
 - Any data transferred will only be seen and made available to Fraunhofer ISI. Findings will only be published in an aggregated way. Please include us into the conversation to sort out details.

During pilot and roll-out

- Tool implementation, i.e. how is the digi label tool presented, is there any promotion, what parallel events / promotions occurred? If possible, take a few pictures/screenshots of online shops. Check with the retailer if we may also use them for reports, however, they are also relevant for use within the project team.
- Pilot: Interview/survey at least 50 customers aware of the digi label and around 5 shop employees about their experiences (further instructions and templates are provided) in two shops
- Roll-out: similar approach, 5-10 shops per country.
- Surveys preferably take place around the end of the implementation period, e.g. in the last month of the 3-month pilot.
- Make sure someone from the project team visits the shop every month to ensure that the Digi-label is still available.

The pilot phase is also a pilot for evaluation. Thus, a revised set of instructions and implementations will be provided later on. Please keep close contact about details and if questions arise.

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Content

Introduction	6
1 Methodology for impact on customers	8
2 Development of Digi-Label	9
2.1 Testing Digi-Label: Pilot and Roll-out	10
3 Methodology for impact in terms of energy efficiency	11
3.1 Impact estimation model from the proposal phase	11
3.2 Data sources for the evaluation	12
3.3 Revised impact estimation model.....	14
3.4 Process overview of information flow during pilot (and roll-out)	16
ANNEX	19
A.1 Estimation on energy demand – forms	19
A.2 Survey of customers.....	22
A.2.1 Aim and target group of the survey	22
A.2.2 Content of the interviews with customers.....	22
A.2.3 Questionnaire.....	22
A.2.4 Implementation	24
A.3 Interviews with shop employees	25
A.3.1 Aim and target group of the interviews.....	25
A.3.2 Content of the interviews	25
A.3.3 Interview guideline	25
A.3.4 Implementation	26

Introduction

Energy efficiency continues to be a key factor for customers when picking electronic products off the shelves, or hitting the 'Check Out' button online. But despite customers wanting to know more about how much energy the latest gadgets use, and how much they will cost to run, current energy labels remain too difficult to understand and do not let customers compare how energy efficient different products are. The Digi-Label Project aims to change that – making energy labels simple to comprehend and more readily available both in store and online. Therefore the project will design and trial a digital tool that will allow customers to assess how energy efficient a product really is – both on a smartphone app used in shops, and through a website containing the latest product efficiency and running cost information – bringing energy labels into the digital era.

In order to monitor the success and impact of the project and to develop a digital solution that really supports customers the project also includes an evaluation process. This evaluation is conceptualised as an integrated evaluation organised in a specifically dedicated work package (WP), namely WP6. The aim of WP6 is twofold; on the one hand it assembles the evaluation activities with regard to project results. This includes gathering relevant data in order to critically assess project impact as well as future impact after project lifetime. On the other hand evaluation results will also be used to improve ongoing project work by ensuring that project outputs are developed and constantly improved according to customer needs.

This WP links closely to all earlier WPs. It is linked to WP2 by using its results and exploring the customer perspective based on them (T6.2.1). The outcomes of this process will then feed into WP3. Furthermore, this WP will closely evaluate the pilot (WP4) and rollout (WP5) activities by developing an overarching framework, collecting and analysing relevant data.

The WP includes three main tasks which are further divided into several subtasks:

- T6.1 – Establish the evaluation framework for all the project activities (Led by Fraunhofer ISI).
 - T6.1.1 – Evaluation methodology (led by Fraunhofer ISI, supported by all partners) (Deliverable 6.1)
 - T6.1.2 – Coordination of data collection activities (led by Fraunhofer ISI; supported by CLASP and ECOS)
- T6.2 – Coordination of evaluation activities in pilot (WP4) and rollout (WP5) activities (Led by Fraunhofer ISI)
 - T6.2.1 – Include customer perspective in label development (led by Fraunhofer ISI; supported by ESCAN, Adelphi, EST, ECOS and SEVEN): two customer workshops (Deliverable 6.2)
 - T6.2.2 – Evaluation of pilot activities (led by Fraunhofer ISI; supported by EST and ESCAN)(Deliverable 6.3)
 - T6.2.3 – Evaluation of rollout activities (Led by Fraunhofer ISI; supported by EST, SEVEN, ESCAN, Eliante and Adelphi) (Deliverable 6.4)
- T6.3 – Digi-label impact assessment overall evaluation of pilot and rollout activities (Led by Fraunhofer ISI)
 - T6.3.1 – Consolidation of data and project impact assessment (Led by Fraunhofer ISI)
 - T6.3.2 – Estimation of possible future impact: assessment of potential (Led by Fraunhofer ISI, supported by all partners) (Deliverable 6.5)

This document constitutes the first deliverable of this WP and therefore has the aim of outlining and refining the process and necessary steps and especially defining the relevant data that is needed and in connection with this also assigning tasks to partners and the retailers / manufacturers involved in this project. The following figure summarises the relationships between tasks and deliverables and gives an overall overview of the WP:

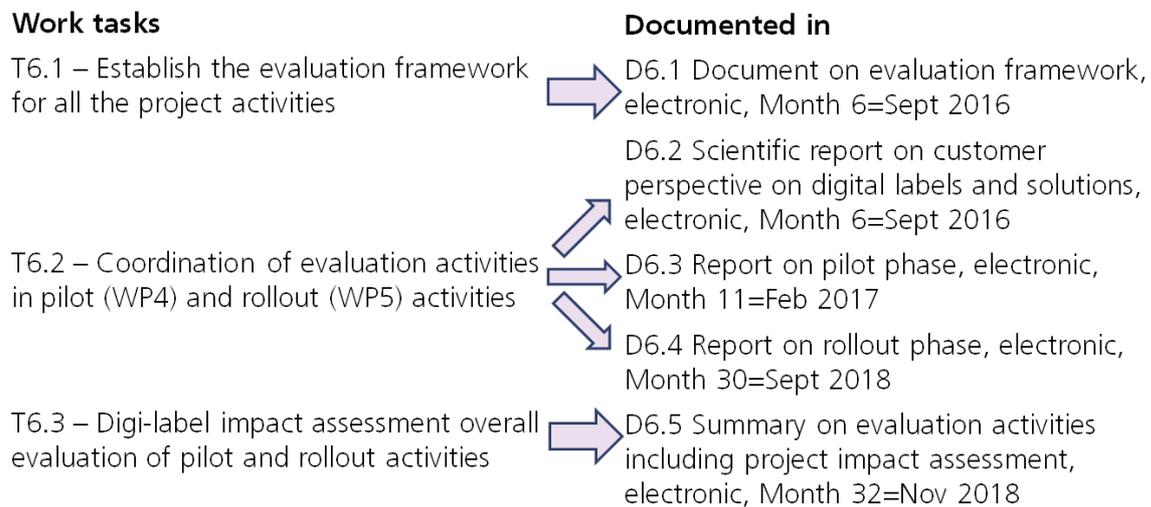


Figure 1 Overview over tasks and deliverables

WP6 is embedded into five overarching objectives of the project:

- **Objective 1:** Develop digital tools and solutions that enable the delivery of enhance and improved information on the energy consumption of appliances to customers in-store – directly, at the point of purchase in partnership with retailers and manufacturers
- **Objective 2:** Design and pilot a customer engagement approach that demonstrates the positive impact digital tools and solutions can have on their customer’s purchasing decisions in partnership with a frontrunner retailer
- **Objective 3:** Refine and rollout the approach to a larger sample of customers in partnership with at least 10 manufacturers and 50 retailers in 5 countries
- **Objective 4:** Monitor and evaluate the effectiveness of the pilot and rollout activities
- **Objective 5:** Extrapolate and demonstrate the market potential and impact that will be achieved when the project results are adopted by policymakers and wider in industry such as manufacturers and retailers

To find out whether these objectives have been reached specific impacts were defined in the project preparation phase. These include impacts on the level of policy making and capacity building, but more relevant to this deliverable also impact by inducing energy savings:

- **Energy savings**
 - **Performance indicator:** Energy savings triggered by the project within its duration
 - **Quantification:** 90 GWh/year in terms of primary energy savings

Defining the needed input data for estimating energy savings is part of this deliverable. The document is structured as follows: The next chapter presents the approach for studying the

customer perspective. Chapter 3 explains the approach for estimating the impact in terms of energy efficiency and the necessary data input. It concludes with a figure summarising the relevant processes. Finally, the annex provides drafts for forms, procedures and questionnaires. The document is for internal use and the idea is to update it when necessary. It is expected that especially after the pilot period a revision to define processes for the roll-out will be necessary. It is supposed to give guidance to the consortium partners to organise a smooth process of inputs and outputs.

1 Methodology for impact on customers

The main aim is to learn more about the customer perspective and how customers deal with labels at the point of sale:

1. Awareness (did/do they notice energy labels? the Digi-Label tool?)
2. Usability and satisfaction (do they use them? what could be improved by a digital solution?)
3. Knowledge increase (what do they learn from a label? does it influence their attitudes? what could be improved by a digital solution? what is your motivation and would therefore be an incentive to use it?)
4. Past and future behaviour (do labels influence their (planned) purchase decision? what could be improved by a digital solution?)

The rationale for the impact on customers starts from the assumption that the Digi-Label tool will be able to influence customer decisions if (3) it provides relevant information and thereby increases customer knowledge, helping them to take an informed decision. And that customer will (2) be more likely to use the Digi-Label tool if the experience is agreeable and leads to customer satisfaction. A precondition to both is that customers are aware of the Digi-Label tool (1). Whether these factors finally influence purchase decisions in the desired way will be evaluated by looking into the impact on sales decisions (see chapter 3), but is already captured as a fourth issue within this approach.

In order to design the Digi-Label in a way that is more likely to be in line with customers' needs and expectations the customer perspective is already integrated in the development of the Digi-Label tool (see section 2.1). Following this section 2.2 specifies the process for evaluating the customer perspective in the pilot and roll-out phase.

2 Development of Digi-Label

The main aim is to learn more about the customer perspective and how customers deal with the current energy label at the point of sale. In addition to this it is aimed at gathering first-hand customer experiences with the Digi Label tool and based on this their ideas for improvement. Therefore, two customer workshops are conducted, one in Germany and one in Spain.

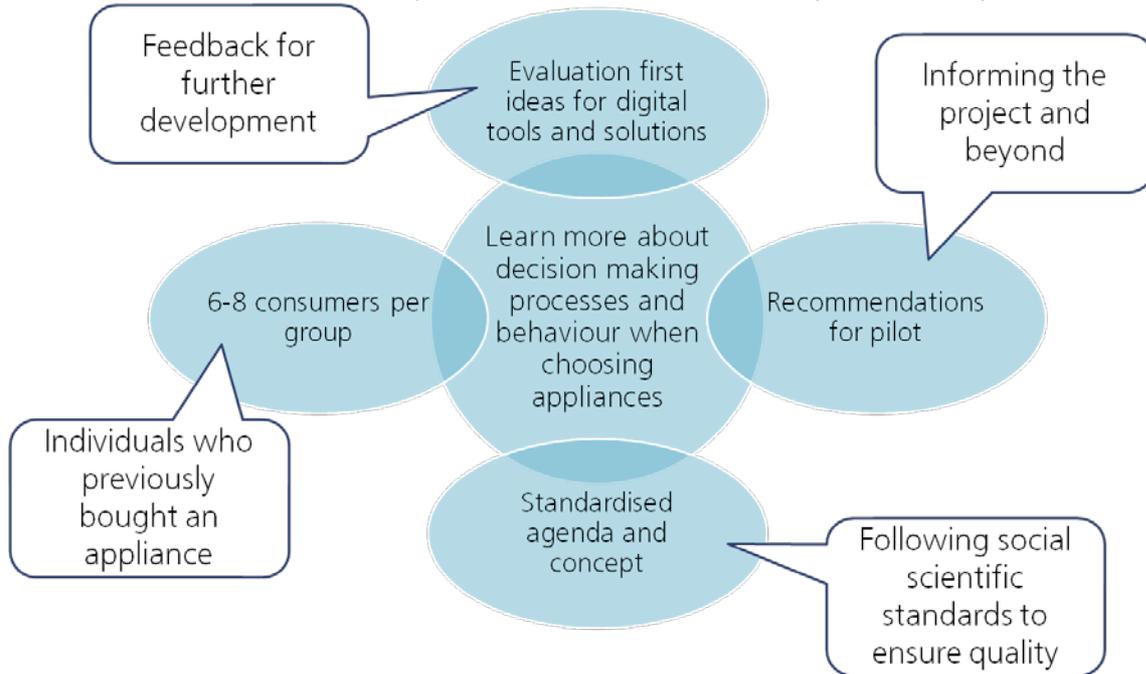


Figure 2: Overview over tasks and deliverables

The structure of the workshops will be as follows:

- Workshops will last 2.5-3 hours.
- Around 8-10 participants per Workshop
- Participants will be compensated for participation
- Workshops will be moderated, preferably a moderator plus assistant is present during the workshop.
- Workshops will follow a discussion guideline prepared by Fraunhofer ISI
- Workshops will be recorded and transcribed.

Workshop participants will be preselected. The focus is on individuals that have recently bought an appliance that is subject to the energy label regulation (excluding lighting devices for the purpose of the workshop). Beyond this, it is the goal to have a heterogeneous group of participants regarding gender, household size, level of education / income, age etc.

The workshop methodology and the findings will be described in more detail in Deliverable 6.2.

2.1 Testing Digi-Label: Pilot and Roll-out

From the customer perspective this part focuses on the four topics outlined above: (1) awareness, (2) usability and satisfaction, (3) knowledge increase as well as (4) behaviour (intended and reported). All topics will be measured through interviews with customers and retailers' employees. Customers will be surveyed in short standardised interviews when leaving the point of sale. For online shoppers an internet-based questionnaire will be provided. These interviews will focus on awareness (did they notice the digital tools and solutions?), usability (did they use them? were there any problems during usage?), knowledge increase (did they learn something new? did it influence their thinking about certain products), past and future behaviour (did they influence their (planned) purchase decision?). It is the aim to interview at least 50 customers who have used the digital labels and solutions in at least two of the pilot stores. A guideline for conducting the interviews is provided in the annex. Conducting these interviews will be in the responsibility of the partners organizing the pilot.

In addition to this interviews with up to five retailer employees per pilot store with varying responsibilities (e.g. including the CEO, sales staff, staff responsible for decorating, in case of online stores people arranging the website / head of marketing) will also be based on an interview guideline and focus on practicalities, their observations about customer behaviour and decision making in relation to digi-labels and solutions as well as suggestions for improvement. Findings will be documented in a report which provides recommendations for the rollout activities. This will be reported in deliverable 6.3.

A guideline for conducting the interviews is provided in the annex. Conducting these interviews will be in the responsibility of the partners organizing the pilot.

A similar approach will be used for the evaluation from the customer perspective in the roll-out phase. Five to ten shops per country will be selected for participating in the evaluation. Interviews with customers and retailers' employees will be using shortened versions of the interview guidelines from the pilot. Again, for online shops, a web-based survey will be used for interviewing customers.

Taken together this implies that retailers participating in the pilot and the roll-out phase will have to be asked for agreement to provide access to customers and their staff. This has to be organised by the partners who are responsible for conducting the pilot and the roll-out (SEVEN, EST, ESCAN, Eliante, Adelphi).

3 Methodology for impact in terms of energy efficiency

The aim of this section is to describe the methodology for evaluating the impact of the Digi-Label project in terms of energy savings. During the proposal phase of the project, a preliminary estimate of the projected energy savings has been elaborated, resulting in an potential of primary energy savings of 90 GWh/year during the project.

3.1 Impact estimation model from the proposal phase

As a starting point for discussing the methodology to estimate the energy savings, the original methodology and its assumptions from the proposal phase of the project are summarised in the following.

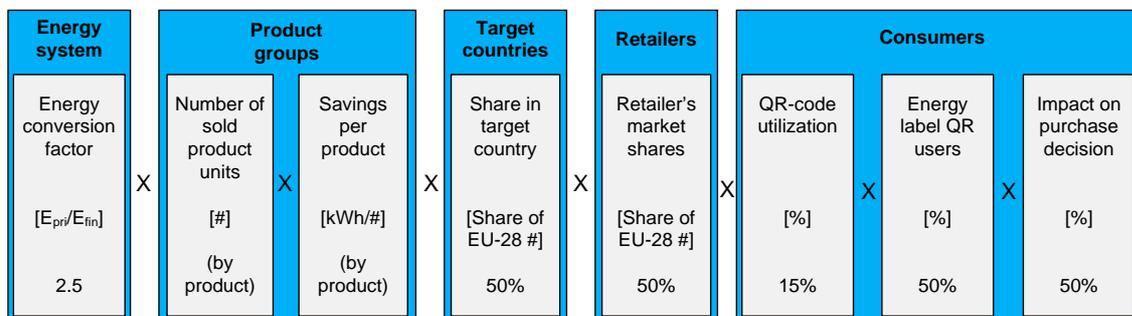


Figure 3 Overview of the impact estimation approach during the proposal phase.

The calculation model from the proposal phase is illustrated in Figure 3: The blue boxes show the different areas that need to be dealt with for the estimation. The first set of lines in each grey box denotes the value that is processed, the following (set of) line(s) in square brackets show(s) the unit of the respective value and the last (set of) line(s) provide(s) the value that have been used in the proposal phase as a first approximation. The assumptions of this model can be summarised as follows:

- **Energy system:**
 - **Energy conversion factor:** A conversion factor from final to primary energy demand of 2.5 is assumed; this factor has been used as constant value for the EU-28 independent of the national energy mixes
- **Product groups:**
 - A set of 9 product groups is expected to be covered by the Digi-Label project
 - **Number of sold product units:** The aggregate sales figures for the EU-28 for these product groups have been derived from several studies and databases.
 - **Savings per unit:** A set of expected savings per unit have been derived from various sources; these savings are based on a shift from an average class to the most efficient class
- **Target countries:**
 - **Share of target country:** As there is a focus on 5 countries (UK, DE, IT, ES, CZ), it has been assumed that these countries make up 50% of the sales of appliances in the EU-28

- **Retailers:**
 - Retailer’s market share: The retailers in the project represent 10% of the sales in the targeted country.
- **Customers:**
 - **QR-code utilization:** 15% of the customers were estimated to use QR-codes
 - **Energy label QR users:** 50% of the customers take energy label information into account
 - **Impact on purchase decision:** 50% of these customers will chose more efficient equipment
 - It follows that an estimated 3.75% of the customers exposed to the Digi-Label project will be influenced in their purchase decision

Based on the overall product of the shares, a total of 0.19% of all units bought in the EU-28 were expected to be improved in energy efficiency terms. The total translates into savings of 90 MWh of primary energy. Thereof a huge share is due to lighting, making in sum up 2/3 of the overall savings. The second largest groups are displays, followed by domestic refrigeration appliances. Washing machines, dishwashers and washer-dryers only make up a smaller fraction of the overall savings (Table 1).

Table 1: Estimation of impact on energy savings according to the project proposal.

Product group	Number of sales [EU-28]	Saving per unit [kWh/a]	Improved units [% EU-28 of sales]	Savings [MWh final/a]	Savings [MWh primary/a]
Domestic refrigeration appliances	21,003,811	84	0.19%	3,308	8,270
Washing machines	14,692,692	25	0.19%	689	1,722
Washer-dryers	700,000	25	0.19%	33	82
Dishwashers	9,241,000	37	0.19%	641	1,603
Residential non-directional lighting	722,147,819	9	0.19%	12,186	30,466
Directional lighting	330,000,000	20	0.19%	12,375	30,938
Displays	78,000,000	48	0.19%	7,020	17,550
Total				36,252	90,630

3.2 Data sources for the evaluation

The estimation of the impact of the Digi-Label project as made in the proposal phase evidently depends on various sources of information. In the evaluation during project, additional sources of information become available. Thus, the preliminary assumptions can be verified and refined and thus, the quality of the impact assessment can be enhanced. Having multiple sources of information at hand also allows using several sources of information which can help to increase the robustness of the impact assessment.

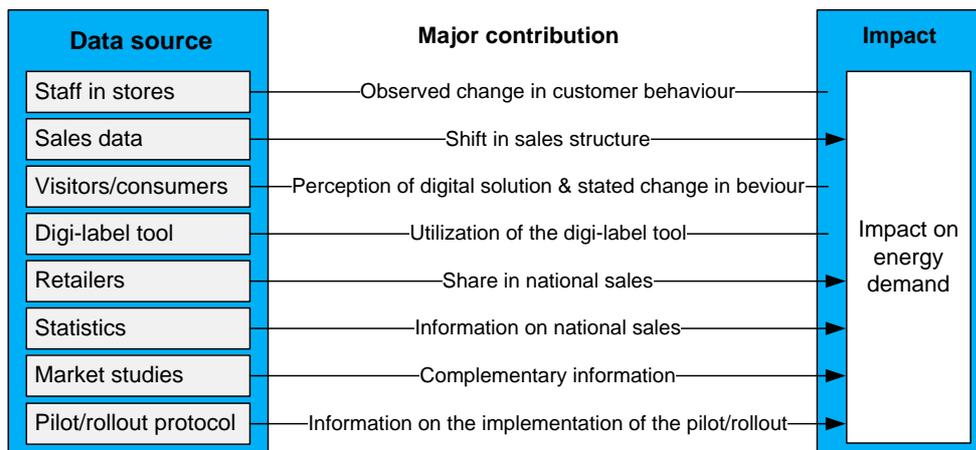


Figure 4 Data sources and their contribution to the impact evaluation.

In total, eight major sources of information can be used to analyze the impact of the project on energy demand (Figure 4). In the following, these sources are briefly described along with a short description how they could relate to the evaluation of the project’s impact on energy demand.

Sales data: Disaggregated sales data from the pilot and rollout shops can serve as a basis to identify shifts in the structure of sales towards digi-labelled products. For analyzing this impact, it is necessary that data on sales is sufficiently detailed and includes specific information on the number of sales in the relevant product groups. Furthermore, information on any specific circumstances from outside the Digi-Label intervention that might affect sales or the structure of sales in the product groups (e.g. promotions) needs to be collected, as well.

Staff in stores: Next to direct interviews with customers, the staff in the stores can also provide insights to understand the impact of the project. Staff members are well suited for this as they are present on location during the pilot and rollout activities. Thus, they can observe any obvious shifts in customer behaviours due to Digi-Label displays (e.g. a more intensified utilization of smart phones during the stay in the shop; more questions on energy-related issues; interest in online-based information sources). Such information and feedback from the staff members can thus provide a better understanding of the impact on place.

Visitors/customers: As pointed out earlier, customers will be asked about their experience and perception of the digital labelling solution. A part of this interview will also cover their past and future behaviour. This information can be used to complement the information on the shift between labelling classes as derived from the sales data.

Digi-Label tool: The Digi-Label tool can be an important source of information for understanding the usage of the Digi-Label solution. The anonymous tracking information gathered through the tool will allow to follow-up which appliances were looked at by consumers. If possible, a very short survey will show up when customers close the tool asking them whether and what purchase decision they made. Linking this information to sales information can also help to understand the link between Digi-Label utilization and sales. Furthermore, the data-base of the Digi-Label tool can also be used to yield information on the average annual energy demand of the products. In combination with market sales data, this allows to calculate energy savings.

Retailers: For estimating the potential overall impact of the project, information on the overall coverage of the local market by the participating retailers is required. A good source of information are the retailers. Alternatively, dedicated market studies may also be a good source of information.

Statistics: When it comes to extrapolating the impact of the Digi-Label project resp. the digital labelling solution to the entire market in the relevant countries, it is necessary to know the overall stock and sales figures in the different countries. Official statistics (e.g. the European PRODCOM database, national statistical databases) can yield such information.

Market studies: There are different types of market studies which can complement the data set. Such studies can include information on the market share of retailers, for example, but they can also provide information on product sales, stock or similar information. Thus, these studies can help to add missing information and to verify data from other data.

Pilot/rollout protocol: The setup of the pilot/rollout phase should be documented. Such documentation should cover aspects such as the setup of the Digi-Label intervention, the addressed products, specific conditions that affect the overall results of the implementation, etc. This information can help to complement information from other sources and it can also be useful to provide an interpretation of the project results.

3.3 Revised impact estimation model

To further refine the impact analysis in terms of energy demand, a revised impact calculation model is to be developed. Using a similar structure for the revised model is helpful as this allows finding out where assumptions and default values in the proposal phase have been well in line with expectations. In this revised model, some of the underlying assumptions need to be reviewed and verified by actual project data and the initial overarching estimates need to be further refined. The structure of the revised calculation model is shown in Figure 5. The areas have been maintained in this version of the model, yet some changes have been made to the considered values. These modifications are briefly commented and an overview of the data collection activities is given for each factor.

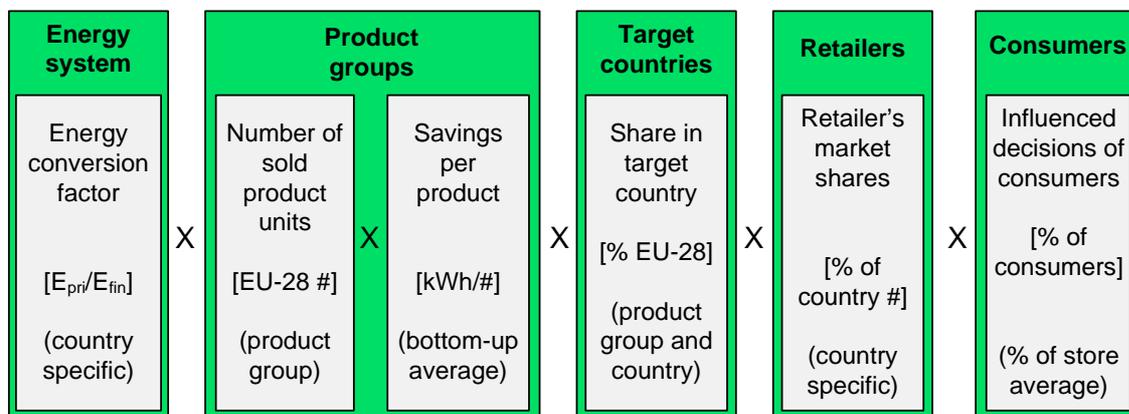


Figure 5 Revised calculation model

Energy conversion factor: The conversion factor describes the conversion efficiency of primary to final energy. As the focus of the Digi-Label project is on electric appliances, this factor mainly reflects the environmental efficiency of electricity production. Evidently, this factor changes with the nationally used energy mix. Thus, for in the revised calculation model, the EU-28-wide common conversion factor from the proposal methodology will be replaced by a country-specific value.

Data requirement	Country-specific conversion factor
Collection time	Draft of the evaluation reports
Data source	Statistics
Responsible	Evaluators (Fraunhofer ISI)

Product groups: In the proposal estimate, nine different product groups have been used to provide the estimate of the overall energy consumption. The estimate is based on two implicit assumptions: first that all groups will be addressed and second that all products within a group will be subject to the digital labelling solution. This assumption seems to be rather optimistic in the short term. Thus there is a need to further differentiate which product groups and to what degree they are actually subject to the digital solution.

Data requirement	List of product groups (pilot phase) List of product groups (rollout phase)
Collection time	Preparation of pilot activities Preparation of rollout phase
Data source	Pilot/rollout protocol
Responsible	Pilot/rollout coordinators (esp. EST, ESCAN, SEVEN)

Number of units sold: In the proposal impact estimation, the number of sold product units for the entire EU-28 has been used as a basis for the analysis. This number was later combined with an aggregate share of the target countries for all products. While such overall sales figures can serve as a baseline, more differentiated sales figures by country would help to provide a more differentiated view on the impact. Thus, the number of sold units should be provided by country to allow for a more differentiated view on the overall sales in the revised model. This is done by introducing a factor that details the share of the different products by target countries.

Data requirement	Number of sold product units in the EU-28
Collection time	Draft of the evaluation reports
Data source	Statistics; Market Studies
Responsible	Statistics and EU-wide studies: Evaluators (Fraunhofer ISI) National market studies: All partners

Savings per product: For the proposal, it has been furthermore estimated that a typical change in customer behaviour will lead to savings that correspond to a shift from an average class to a product within the best class. This simplification will need more refinement, as customers may also choose smaller or bigger improvements, e.g. shifts from one class to the next higher class or they will start from a below-average class and decide to select a top class model. For determining the savings due to the use of the digi-label, different methods can be used:

- **Stated improvement:** Arbitrarily chosen customers aware of the digi-label solution visiting the pilot-/rollout-shops could be asked about a hypothetical situation. In this situation, they might be asked how much they would have improved the energy efficiency class due to using the digi-label solution.
- **Revealed improvement:** Customers actually buying a product subject to the digi-label solution could be asked how they have been influenced by the digi-label solution and state the class of their chosen product and a production they would have chosen otherwise.

- Estimation based on sales data: If a pilot-/rollout-shop can provide information on the sales in terms of efficiency classes, then a shift in terms to higher performing equipment might be observed after putting in place the digi-label solution. Yet the challenge with this approach is that many other factors (e.g. advertisement campaign, local construction sites, weather, etc.) may potentially also affect this aspect and furthermore, sales have to reach a certain number of sales regularly as otherwise, small shifts in efficiency classes will not be visible in the sales figures. Yet this will be the preferred solution for estimating the savings.

Data requirement	Savings per product (resp. data for calculation them)
Collection time	Conclusion of pilot/rollout phase
Data source	Sales data; customer interviews; staff in the stores
Responsible	Pilot/rollout coordinators (esp. EST, ESCAN, SEVEN)

Share in target country: For the revised calculation model, the share of products in the individual countries will be used instead of an aggregate for all target countries. Furthermore, these shares should be disaggregated by product group.

Data requirement	Share by country and product group
Collection time	Draft of the evaluation reports
Data source	Statistics; Market Studies
Responsible	Statistics and EU-wide studies: Evaluators (Fraunhofer ISI) National market studies: All partners

Retailers: For the retailers, the share should also be broken down by country and product group, if obtainable.

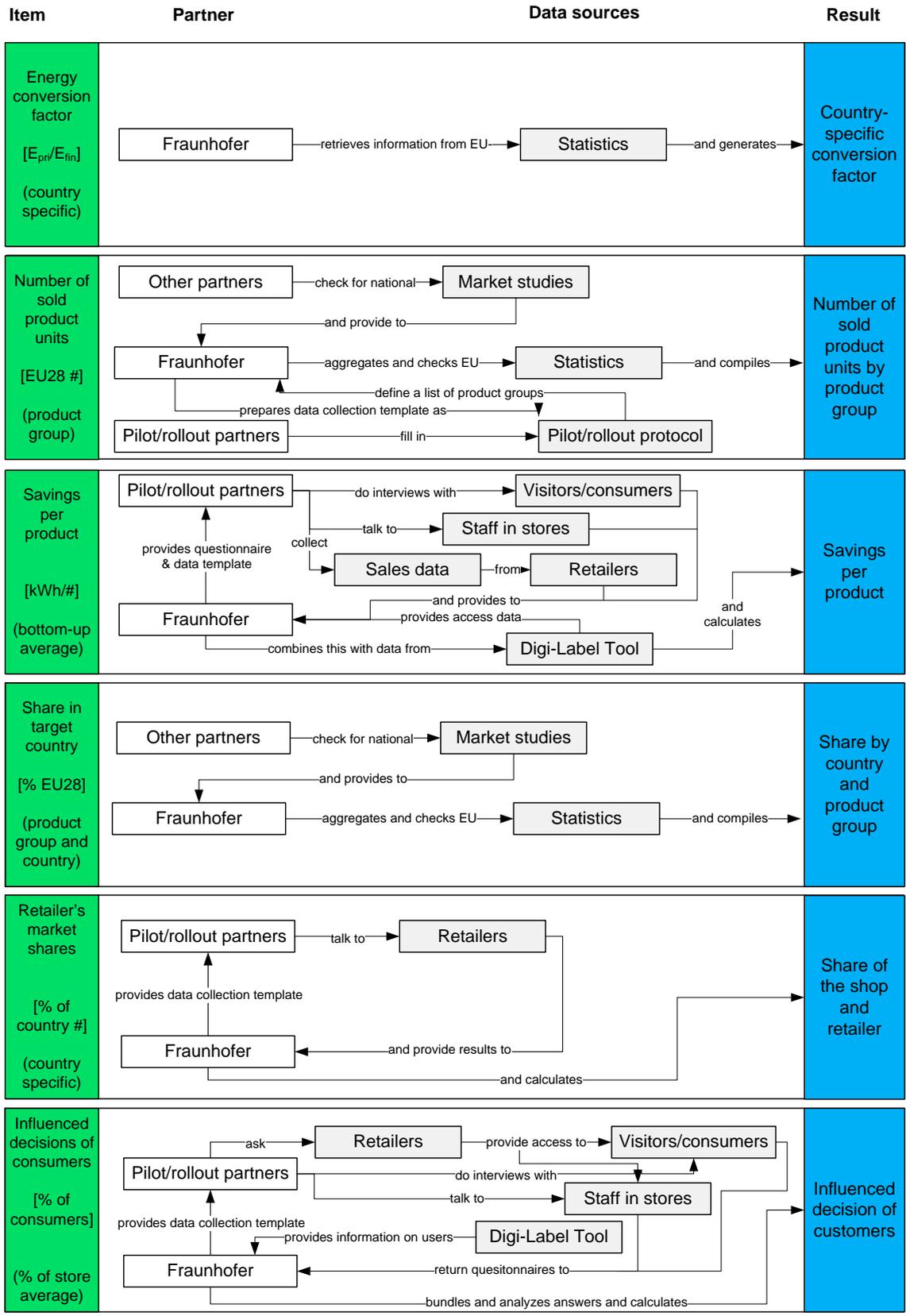
Data requirement	Market share of the shop and retailer
Collection time	During pilot/rollout phase
Data source	Retailer
Responsible	Pilot/rollout coordinators (esp. EST, ESCAN, SEVEN)

Influenced decisions of customers: In the original proposal, the share of influenced decision was obtained by providing estimates on the utilization of QR codes, the users of the label and the influenced decisions by these users. In the project, this view can further be refined during the interviews. There, it is possible to collect more details on the actual awareness, perception and utilization of the label.

Data requirement	Influenced decision of customers
Collection time	During pilot/rollout phase
Data source	Staff in stores; visitors/customers
Responsible	Question development: Fraunhofer ISI Conducting interviews: Pilot/rollout coordinators (esp. EST, ESCAN, SEVEN)

3.4 Process overview of information flow during pilot (and roll-out)

An overview on the information flow for each of these data items and a data collection for is provided in the figure below.



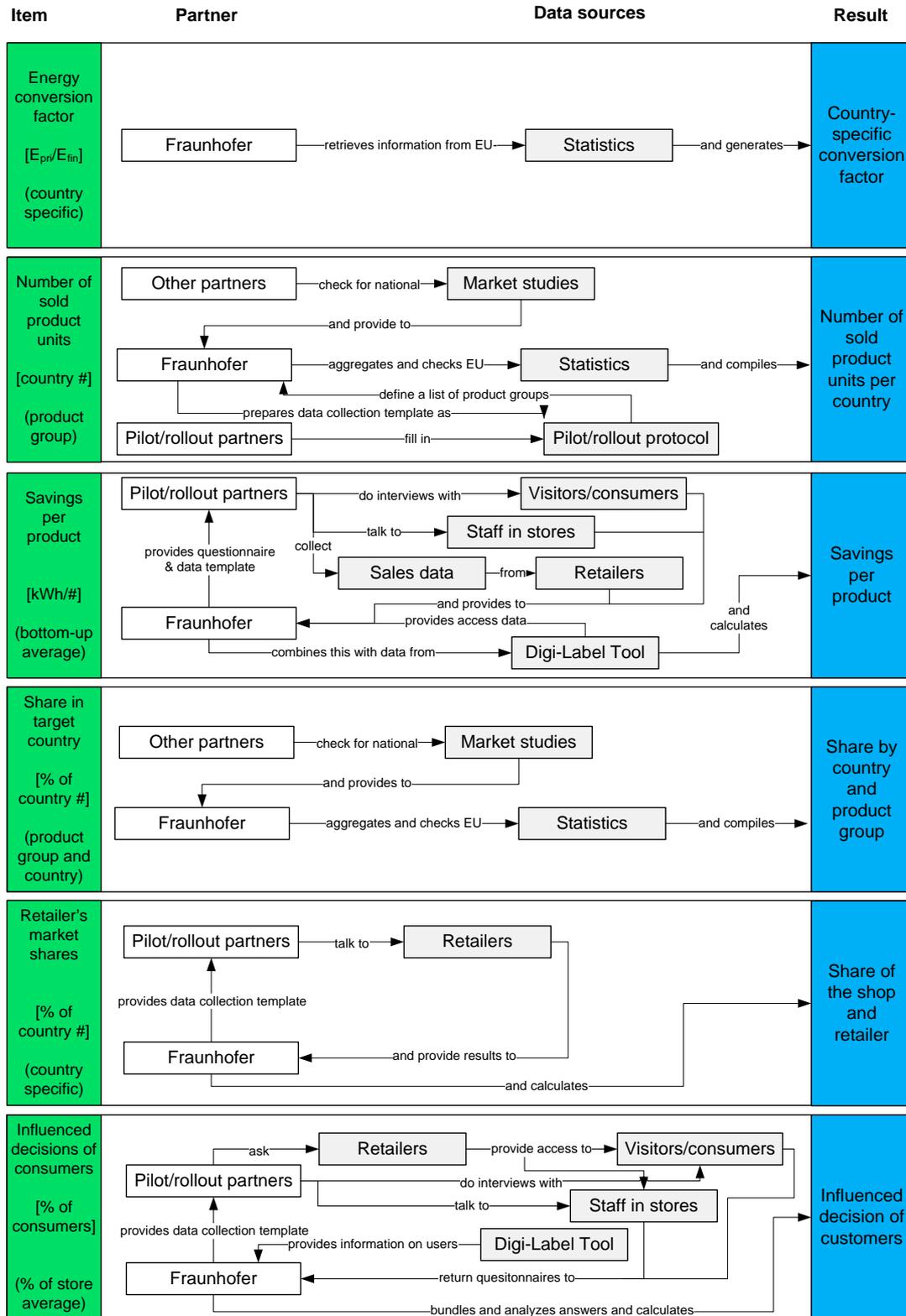


Figure 6: Information flow and data collection framework.

ANNEX

A.1 Estimation on energy demand – forms

Store details		
Name	(name of the store)	
Contact details	(street, city; phone number)	
Country	(country of the store location)	
Website (if any)	(preferably store website, not corporate/general website)	
Contact person	(name and contact details of the contact person in the store)	
Store profile		
Opening hours	(provide the opening days/hours as general background)	
Location	(give some indication on the general setup of the store, e.g. stand-alone store or in a mall; rural or city area)	
Sales area [m²]	(provide an indication of the stores sales area in m ² for all products as general background)	
Number of fulltime employees [#full time equivalent]	(provide an indication of the stores number of full time equivalents as general background)	
Number of visitors per day [#visitors/day]	(provide rough estimate of the number of store visitors per day)	
Number of customers per day [#customers/day]	(provide a rough number of customers of the store per day)	
Main target customers	(provide information on targeted customers e.g. low-price segment; high-price segment)	
Shares in the sales of the country		Share of the store Share of the retailer
	(preferably by product group, otherwise as an aggregate; either by % in terms of numbers or sales volume; should be provided both for the store itself and for the retailer as a whole in the country)	
Domestic refrigeration appliances		
Washing machines		
Washer-dryers		
Dishwashers		
Residential non-directional lighting		
Directional lighting		
Displays		

Table Annex 1: Collection form for the store setup (Excel-file).

General setup	
Start of the pilot/rollout activities:	(date; if relevant: time)
End of the pilot/rollout activities:	(date; if relevant: time)
Product portfolio	
Domestic refrigeration appliances [No; Yes, but not covered; Yes, partially covered; Yes, fully covered]	(indicate whether the product group is offered in the store and to what degree it is covered by the Digi-label solution)
Washing machines [No; Yes, but not covered; Yes, partially covered; Yes, fully covered]	
Washer-dryers [No; Yes, but not covered; Yes, partially covered; Yes, fully covered]	
Dishwashers [No; Yes, but not covered; Yes, partially covered; Yes, fully covered]	
Residential non-directional lighting [No; Yes, but not covered; Yes, partially covered; Yes, fully covered]	
Directional lighting [No; Yes, but not covered; Yes, partially covered; Yes, fully covered]	
Displays [No; Yes, but not covered; Yes, partially covered; Yes, fully covered]	
Digi-label intervention	
Type of activities	What type of digi-label activities were put in place? (e.g. additional displays, replacement of old displays; installation of tablets; specific information on Digi-Label intervention?)
Intensity of activities	What was the intensity for the presentaiton of the digi-label information ? (e.g. prominently on top sales product, all products; for the products in front, or to the back)
Intervention changes	Have there been any major changes to the digi-label setup during the pilot/rollout? (if yes, please describe these changes including a date)
Pictures of setup	(if possible, please take pictures of the general digi-label setup at the beginning and the end of the intervention)
Specific circumstances	Have there been any specific circumstances that could have affected sales of the relevant product groups? (please list and describe any specific circumstances that could affect the impact of digi-label sales, e.g. promotions of certain products in the relevant product groups; advertisement campains; construction sites close to/in the shop; extra opening times; substantial changes in purchase prices etc.)
Staff members	To what degree have staff members been involved in preparing the digi-label intervention? (e.g. only few staff members had some information on the project; all statt members have been thoroughly informed about the intervention)
Some tipsps for the implementation	
Take pictures	Please ask the shop owner whether you can take pictures from the product setup and whether these picture might be used for project reports or only for the scientific evaluation process in the project.
Provide a store layout	If possible, please provide a rough sketch of the store layout including an indication where the digi-label products and other product in the groups are located in the store and where the customers enter and leave the store.
Using tracking information	If possible, please try to use specific tracking information for the different displays in the store. Pictures on how the different displays are accessible in the shop would be helpful, best along with information where the labels are located within the store.

Table Annex 2: Collection form for the digilabel setup (Excel file)

Product category	Digi-Label	Brand	Model	Energy efficiency class	Annual energy consumption	Sales price																								
<i>Default product category</i>	<i>Information whether the product was digi-labelled during the pilot/rollout phase</i>	<i>Brand of the model to product fiche</i>	<i>Name or identifier of the model</i>	<i>EU energy efficiency class according to product fiche</i>	<i>Annual energy consumption per product fiche</i>	<i>Approximate average in digi-label period; typically in Euro, if not, add this information</i>																								
Freezer	Yes	Fridgemaster	MUZ5582A2	A++	141 kWh	180 €																								
Number of sales in similar period before digi-label implementation																														
01.04.2016	02.04.2016	03.04.2016	04.04.2016	05.04.2016	06.04.2016	07.04.2016	08.04.2016	09.04.2016	10.04.2016	11.04.2016	12.04.2016	13.04.2016	14.04.2016	15.04.2016	16.04.2016	17.04.2016	18.04.2016	19.04.2016	20.04.2016	21.04.2016	22.04.2016	23.04.2016	24.04.2016	25.04.2016	26.04.2016	27.04.2016	28.04.2016	29.04.2016	30.04.2016	01.05.2016
3	5	4	10	6	13	1	2	7	1	14	7	6	4	4	7	14	9	6	15	10	11	13	0	9	11	4	7	4	4	10
Number of sales during the rollout/pilot phase																														
01.06.2016	02.06.2016	03.06.2016	04.06.2016	05.06.2016	06.06.2016	07.06.2016	08.06.2016	09.06.2016	10.06.2016	11.06.2016	12.06.2016	13.06.2016	14.06.2016	15.06.2016	16.06.2016	17.06.2016	18.06.2016	19.06.2016	20.06.2016	21.06.2016	22.06.2016	23.06.2016	24.06.2016	25.06.2016	26.06.2016	27.06.2016	28.06.2016	29.06.2016	30.06.2016	
7	7	6	12	7	7	12	9	10	8	2	9	1	7	2	9	4	0	2	10	6	4	13	3	13	12	11	6	13	8	

Table Annex 3: Collection for product sales by product (Excel file)

Please note that for the collection of sales data, it is not necessary to fill in the field “energy efficiency class” and the field “annual energy consumption”. This data will be added from the Digi-Label Tool database. The sales prices does not need to be mandatorily obtained, but it would helpful to have it.

Please adjust the time period for the data collection to your implementation activity. It is aimed at gathering the data for the full duration of the pilot / roll-out period plus a control period of the same length. Details need to be agreed upon in direct consultation with the retailers.

The most preferred option is to receive sales data. It is intended to sign a confidentiality agreement, e.g. defining ways of transferring the data to the consortium, defining who has access to the data. In case, the data were fully available it would allow more freedom in developing different ways for estimating results. Alternatively, retailers could also provide the changes in efficiency class chosen by customers per product group, e.g. frequencies of products per available class per product group. If no access to data is possible, changes could also be estimated based on expert opinion, i.e. through the interviews with shop employees.

A.2 Survey of customers

A.2.1 Aim and target group of the survey

The survey will evaluate the new labeling solutions, assess their impact and contribute to further improvements of these solutions. It is the aim to interview at least 50 customers who have used the digital labels and solutions at the point of sale in at least two of the pilot stores.

A.2.2 Content of the interviews with customers

The questionnaire contains standardised questions with defined answering options.

At first, it will be asked, which appliance they were interested in. These interviews will focus on awareness (did they notice the digital tools and solutions?), usability (did they use them? were there any problems during usage?), knowledge increase (did they learn something new? did it influence their thinking about certain products), past and future behaviour (did they influence their (planned) purchase decision?). Furthermore, some sociodemographic variables are surveyed.

Additionally, a slightly adapted online version of the questionnaire will be prepared for surveying online shoppers or as an addition to point-of-sale interviews.

A.2.3 Questionnaire

Introduction: Hi, my name is from the I have seen that you are interested in purchasing an appliance / I wondered whether you have been looking for an appliance [pilot: fridge / washing machine].

If no: Sorry, to disturb you and good bye.

If yes: Do you have a few minutes time to answer a few questions about energy efficiency? [Precise intro to be defined depending on country etc.]

Thank you very much. This interview is part of a project which developed a new tool to support customers when buying appliances [Prepare sheet as hand out with project information].

The information gathered will be analyzed anonymously, thus the report on the results will not include any personal data, nor will any comments or inputs be attributed to any participant or organisation. Do you have any questions about the interview before we start?

1. When you came to this shop today, were you interested in any of the following appliances?

[Adjust answering options to appliances covered by digi label]

Multiple answers allowed

	<i>For appliances ticked: Have you decided which one to buy?</i>
Refrigeration and / or freezer	<input type="checkbox"/> yes <input type="checkbox"/> no
TV	<input type="checkbox"/> yes <input type="checkbox"/> no
Washing machine	<input type="checkbox"/> yes <input type="checkbox"/> no
Laundry dryer	<input type="checkbox"/> yes <input type="checkbox"/> no
Dishwasher	<input type="checkbox"/> yes <input type="checkbox"/> no
Air conditioner	<input type="checkbox"/> yes <input type="checkbox"/> no
Electric oven	<input type="checkbox"/> yes <input type="checkbox"/> no
Vacuum cleaner	<input type="checkbox"/> yes <input type="checkbox"/> no

Range hood	<input type="checkbox"/> yes <input type="checkbox"/> no
No → Thank you, that's all we wanted to know (end of interview)	

If purchase decision was taken, please insert type and model:

Introduction to the label: In this shop you can access a digital energy label via a QR-code [show picture]. It is additional to the conventional energy label and provides further information on the energy efficiency of the appliances and some more aspects.

2. Did you notice the digital energy label?

- Yes
- No → **Thank you, that's all we wanted to know (end of interview)**
- I don't know what this is.

3. If you noticed the label: How did you become aware of the digital energy label?

- I saw it when looking at the appliances
- The staff raised awareness to the label
- The person I was shopping with raised awareness to the label
- I was aware of the label before
- Other
- I don't know

4. Did you make use of the the digital energy label / scan the QR code?

- No → **Go to question 5**
- Yes → **Go to question 7**

5. If you did not use the digital energy label: Why not?

- I did not need it.
- I was not interested.
- I did not understand it.
- I could not access it / it did not work (no smartphone/technical problems...)
- Other reasons, namely _____

6. If you used the digital energy label: Did you learn something new from using the digital energy label?

- Yes
- No

If yes, please explain: _____

7. Did the digital energy label influence your thinking about certain products?

- Yes
- No

If yes, please explain: _____

8. Did the digital energy label influence your (planned) purchase decision?

- Yes
- No

If yes, how (if possible fill in type / model / no / efficiency class):

- It confirmed my original preference which is _____
(if not filled in already in Q1)
- I chose or now prefer another product which is more energy efficient
My original preference was _____
Now my preference is _____
- Other influence, namely _____

9. Did any problems occur during accessing / using the digi-label?

- Yes
- No

If yes, please explain: _____

We are now almost at the end of the questionnaire. Now I would like to ask you a few questions on your personal details.

10. Gender

- Female
- Male

11. How old are you? (alternatively: use categories)

20 years or younger
20 to 50 years
50 years or older

Thank you for participating in our study! If you are interested in hearing about the results of this study, please insert your email-address in this list. We would like to thank you for your efforts by giving XXX € / a voucher of XXX € to one of our interview partners which will be randomly drawn. If you would like to participate in this please indicate on the list.

A.2.4 Implementation

Customers will be surveyed in short standardised interviews when leaving the point of sale. Personal interviews are the preferred way of conducting the interviews as this leads to the highest feedback rates; questionnaires will be translated into the local language. Answers will be documented by the interviewer on the questionnaire sheet. For online shoppers a slightly adapted web-based version will be prepared and customers will be asked to participate after using the digi-label tool. However, it is expected that only a small share of customers will participate in the online version.

How do you arrange interviews?

Address customers leaving the point of sale for household appliances in the pilot stores. Introduce yourself and ask customers for a few minutes of their time. If possible, try to interview individuals who purchased an appliance or wanted to buy an appliance that is (digi-)labeled. Try to place yourself in a crowded but quiet area in the shop or at the exit where you can interview the customer. Details obviously need to be arranged together with the retailer. Inform customers briefly on the

objective of the study, the duration of the interview (around 5 minutes) and the confidentiality. Ask the customer on his/her willingness to take part.

How do you conduct interviews?

Ask the questionnaire questions to the customer and fill in the answers. Fill in one questionnaire per customer. After the interviews, thank the customer for taking part in the study and offer them to keep them informed on the project results. If they are interested in it, put their email address on a list, independent of the questionnaires. This list will also be used for organizing the price draw. In addition it might prove helpful to offer some small sweets as a direct reward.

A.3 Interviews with shop employees

A.3.1 Aim and target group of the interviews

Similar to the survey, the interviews will evaluate the new labeling solutions, assess their impact and contribute to further improvements of these solutions. In the survey, changes in retailers' employees' knowledge and satisfaction with the new digital tools and solutions are to be analyzed. This will be done through content analysis.

Per pilot store up to five retailer employees are to be interviewed. Interviewees should hold varying responsibilities (e.g. including the CEO, sales staff, staff responsible for decorating).

A.3.2 Content of the interviews

The interviews are based on an interview guideline and focus on practicalities, their observations about customer behaviour and decision making in relation to digital labels and solutions as well as suggestions for improvement. Furthermore, some sociodemographic variables are surveyed.

A.3.3 Interview guideline

Good morning. Thank you for giving your time for this interview. It will last about 20-30 minutes. As mentioned in our email, we will not attribute anything that you say to you personally, nor to the organization for which you work.

- 1. What is your position in your organisation?**
- 2. What kind of information do you provide to the customer with regard to the digi Label, how is it presented in the shop?**
- 3. Is there any promotion of the digi Label in your shop?**
- 4. Were the sales staff / were you trained with regard to the digi Label?**
- 5. What is your impression of the customer awareness and impact of the digi Label in your shop?**
 - What do you think about the access to the digi Label?
 - How many of the customers use it (please give an estimate in %)? How much time do they spend on it? Why do they not use it?
 - Does it influence product choice? How often (please give an estimate in %)?

- What is your rating in efficiency increase achieved? (in energy efficiency classes, i.e. choosing an appliance two classes higher)
- [additionally a template for estimating this according to product group will be provided]
- Overall: is the digi label useful to customers? Why (not)?
Please differentiate between product groups if applicable.

6. **Did you recognise any (other) change with regard to the customer behavior after the introduction of the digi Label in your shop?**
7. **What further information / features would be useful for the customer as part of the digi label?**
8. **Do you have any recommendations regarding the digi label itself and its implementation?**
9. **What do you think could make people using it?**
10. **Are there any further remarks or comments you would like to share?**

Thank you for participating in our study! If you are interested in hearing about the results of this study, please provide your email-address

A.3.4 Implementation

How do you arrange interviews?

At first, the potential interviewee is contacted by sending him/her an E-Mail or calling them. Alternatively, arrangement could be made through the shop management. In this first contact you inform the (potential) interviewee on the objective of the study and on the interviews planned (duration, conducted face-to-face/by phone, confidentiality), explain to him or her why their participation in the study is essential, potential benefits for him/her (results etc.) and ask him/her on his/her willingness to take part. A template for this will be provided.

How do you conduct interviews?

Please record the interview. Then it is possible for you to listen to it again and take down notes later. In this way you can concentrate on the interview itself while conducting it and nothing gets lost. If the interview partner is unsure if he/she wants to agree to a recording of the interview, please explain

- that recording is for his/her benefit in terms of accuracy, as it is usually not possible to take note as extensively as necessary and via the audio record it is ensured that the information provided will be complete
- that the audio record will be used for no other purpose than creating an interview protocol and that it will be deleted as soon as this is completed
- that anonymity and confidentiality are guaranteed
- that recording is state of the art in scientific projects to ensure data quality

If these arguments do not work, offer

- that the interview partner may have a look at the interview protocol

Do never record the interview if the interview partner does not give his/her consent! If recording is not possible, take as many notes as possible and complete them directly after the interview.

How do you document interviews?

After conducting the interviews we would like to ask you to provide us with an **English** (or German) summary from the interview. A template for this will be provided. We also provide an example for such a summary. Listen to the recording of the interview to do the summary. Please add some original quotes at important points, verbally transcribing in the original language what the interview partner has said (please add an English translation for these quotes).